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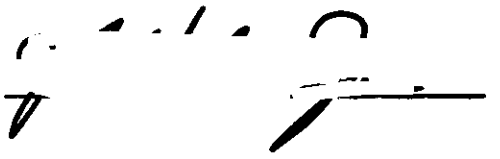

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A SIMULATION MODEL OF A FELONY COURT

A THESIS

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by

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SUMMARY

The problem of insuring that every citizen is granted his constitutional rights of a speedy trial is becoming more and more difficult, especially in the urban courts. For years there has been a large expenditure of money and effort to solve this problem; however, only in the last few years has the effort been made using quantitative analysis techniques. It was the objective of this thesis to use one of these techniques, that of computer simulation, in an attempt to develop several recommendations for eliminating some of the causes for these delays.

The model presented in this paper seeks to represent the actions which take place in connection with processing felony defendants through the Superior Court of Fulton County, Georgia. Specifically, it is the intent of this thesis to accurately model the time period from Grand Jury indictment to initial case disposition.

The GPSS II model creates transactions, based on historical data, representing indictments for ten different types of offenses. These indictment transactions are then converted into the proper number of different defendants with each defendant being assigned a jail, bond, or non-arrest status. Defendant transactions are then scheduled for trial based on real world priorities. Finally, each defendant's case is disposed of based on sample data taken from court records.

The primary conclusion stemming from this research was one concerning the court's summer vacation. The backlog created by this vacation

significantly affected defendant scheduling for over eight months. Another conclusion indicated that some delay could be eliminated by using a plea bond calendar.

CHAPTER I

INTRODUCTION

Background

> An accused person has important rights. In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process [subpoena] for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.
>
> Constitution of the United States
> Amendment VI, December 15, 1791

For at least the last decade, this right of every citizen to a speedy trial has been more of a hope than a reality in many urban courts. As a result of this undesirable delay, many different groups have attempted to solve this problem. Thousands of dollars have been spent by federal, state, and local governments to try to eliminate these delays. In addition to government money, the private sector in the form of foundations, committees, and concerned citizens have spent considerable time and money seeking solutions to the problem of court congestion. However, due to the very nature of the subject, almost all research in this area has been done by individuals skilled in the social sciences. While this approach has been productive and noteworthy, it is the belief of this author that many of the problems connected with court delay can be reduced and perhaps eliminated by using some of the quantitative

problem solving techniques employed by business and industry.

Objective and Scope

The objective of this research is to use a quantitative approach to seek ways of providing each defendant with a speedy trial. Since another goal of the research was to fulfill the thesis requirements for a master's degree, it was felt that the scope of the investigation should be limited to a court system within the Atlanta area. After an initial investigation, the decision was made to further limit the research and focus the attention on the Criminal Jury Division of the Superior Court of Fulton County. This court is responsible for administering justice to all defendants charged with violating Georgia state felony laws within Fulton County, Georgia. It is interesting to note that, about a month after the decision was made to examine this court, the court received a tremendous amount of criticism from several sources. Most of this criticism accused this court of using inefficient and outdated procedures, causing excessive wastes of time and money.[1]

Following more detailed research into the selected court system and reviewing the works of others outside the state of Georgia, it was decided that an excellent quantitative technique would be that of simulation. Due to the highly complex nature of the court system and the fact that there are multiple interactions between many different and sometimes opposing forces, it was felt that simulation would be one of the few analytical methods which could address the total system with any degree of success.

A major benefit to using a simulation model is that it enables the

researcher to investigate the merit of many alternatives without having to disturb the normal court process. The court is not forced to endure various experiments which may or may not benefit the system. While disturbances are undesirable in any system, it was found that the courts are particularly sensitive in this regard.

Literature Survey

While the reasons mentioned above provided enough evidence to warrant a simulation approach, further research revealed evidence of a more concrete nature. During 1966, a Presidential commission was formed to conduct an in depth investigation of all facets of crime within the United States. This commission, The President's Commission on Law Enforcement and Administration of Justice, was divided into different task forces. Each group had the primary responsibility of investigating only one aspect of the total crime problem. In connection with the task force researching the courts, a computer simulation model was developed for certain Washington, D. C. courts. This approach was so effective that the entire commission issued the following major recommendation: "The simulation techniques developed should be extended to several large urban areas as pilot studies with Federal support to determine their applicability to other court systems and to develop them in further detail."[2] This recommendation strengthened the belief that the quantitative approach chosen earlier was the correct one.

Prior to discussing the works of other authors applying quantitative techniques to the problem of court congestion, the reader should be made aware of certain facts. Within the United States no two state court

systems are alike. Each state system is quite unique and research in the area, to be useful, must be specifically tailored to that state. Since there has been no known research using quantitative methods within the state of Georgia, the work of the other authors outside the state is of little benefit. For that reason, the brief descriptions which follow are presented primarily to point out to the reader the state of the art within court systems.

The first major research done in the courts area using a simulation approach was the work previously mentioned in the District of Columbia courts. Joseph A. Navarro and Jean G. Taylor, working with the Courts Task Force, used 1965 data to develop a "simulation model of the processing of the felony defendants in the District of Columbia trial court system."[3] Their model, COURTSIM, "simulated a defendant entering the court system by generating an identification number and providing storage for relevant data including most serious charge, bail status, number of defendants in case, number of motions to be filed, date and time entering, etc."[4] COURTSIM accomplished its objective by attempting to model each day the court operates, dividing a day into 60 units. Using time distributions based on sample data, the felony defendant's case is moved through the system, waiting the appropriate amount of time at each phase of processing.

The major recommendation resulting from Navarro and Taylor's effort was one calling for the addition of a second Grand Jury. Further, the model results indicated that the hypothesized timetable developed by this commission appeared to be a reasonable standard. A portion of this

timetable will be used by this author. In conclusion, COURTSIM demonstrated conclusively that the simulation approach to the problem of court congestion can be used effectively.

Following this initial venture into the judicial field, Blumstein and Larson presented another type of modeling approach in 1969. Rather than using a computer simulation model, these authors developed linear and feedback mathematical models designed to represent the total criminal justice system. Their goal was "to describe in a quantitative way the operation of the system that tries to apprehend, adjudicate, and rehabilitate offenders, and to assess some of the effects of this system on their future criminal behavior."[5] While there was no attempt on the part of these authors to use their model in a computer simulation, this could be a direction for future research.

Using some of the ideas developed by Blumstein and Larson, a group of researchers investigating the Virginia court system presented several ideas for combining mathematical and simulation models. Bailey, McPheters, and Schotta had as their primary objective to present "a general model for finding through simulation the optimal distribution of courts in a geographical area."[6] Their work consisted mainly of ideas without substantial rigorous development. However, their work does serve as the first quantitative attempt to more efficiently allocate the court resources of a state.

Perhaps the latest quantitative models dealing with the courts are the scheduling models presented by Jennings in May, 1971. Prior to the discussion of his own models, the author provides a short summary of the other recent research dealing with quantitative analysis of the courts.

In this summary he mentions the previously discussed material plus a simulation model similar to the D. C. model. While efforts to obtain more detailed information about this model have failed, Jennings' discussion reveals that it is a detailed simulation model of a portion of the New York City Criminal Court. "In this model, the court day is simulated minute-by-minute, taking into account the characteristics of each case to be processed and the actual activities of each judge, district attorney, and defense lawyer."[7]

Jennings' article further discusses his original scheduling models designed to eliminate overscheduling or underscheduling on a particular court calendar. He postulates two models, the simple, fixed-calendar-size model and the deterministic, variable calendar-size model.[8] Both of these models could serve as a basis for further research in conjunction with present and future simulation models.

Model Comparison

While in many ways the model developed in this paper will be similar to the two simulation models previously discussed, it will also be quite different and unique. That is, though each model seeks to represent the actions of the court, each is designed especially for a single specific court system.

In addition to the differences caused by court location, this author intends to design certain features into the model which have not received wide attention in the past. Specifically, efforts will be made to identify, in a more detailed fashion, the characteristics of the different types of offenses. Also, more detail will be added with regard to

bond forfitures and continuances. Finally, it is hoped that validation efforts will be more extensive than those used in previous models.

CHAPTER II

REAL WORLD SYSTEM

Source Material

Prior to starting the discussion of the real world system, some mention should be made about how this information was obtained and why it was obtained in that manner. Initially, every effort was made to find some written material about the administration of justice in Georgia which someone without extensive legal training could understand. In this search several articles were found pertaining to specific aspects of the system, but the area in general was practically void of good written source material. As a result of this near void, any researcher in this field must be prepared to conduct extensive interviews to gain in depth knowledge about the system. For that reason, almost all of the knowledge peculiar to the Georgia courts was obtained through personal interviews. The results of these interviews will serve as the basis for the description of the real world system. Also, it should be noted that the procedures described in the following represent the practices and policies in effect from January 1970 through April 1971.

System Overview

For the layman to understand the model, it is essential that he first understand how the system presently operates. While a detailed discussion about this process could be a book by itself, an attempt will

be made to limit the detailed description to that facet of the court process to be modeled. However, a brief description of the total system will be given to provide the reader with a better perspective of where the model fits into the entire criminal justice system.

Figure 1 presents a model of what takes place from time of arrest of a felony defendant to the time his case is disposed of. It is the objective of this thesis to model only that portion of the system from Grand Jury indictment to the initial dispostion of the case. The entire process could be modeled without much more difficulty; however, the lack of sufficient data prevents this at present.

Arrest to Grand Jury Indictment

As seen in Figure 1, the first phase of the process is the arrest to first judicial appearance phase. The first judicial appearance is also known as the commitment hearing. Following the arrest, the defendant is normally afforded the opportunity, in non-capital offenses, to make bond. Within certain time limits after the arrest, the defendant must be brought before a commiting magistrate, which serves as his first judicial appearance. In Atlanta, the commiting magistrate is a municipal court judge. During this first appearance, the judge has several options open to him when handling a felony case. First of all, the judge can dismiss the charge for lack of evidence. The judge can also grant a continuance to provide the defendant more time to prepare his case. The judge can afford the defendant his right to have a preliminary hearing. Finally, the judge can bind the case over to the Superior Court of Fulton County if he feels there is enough evidence to support a state felony charge.

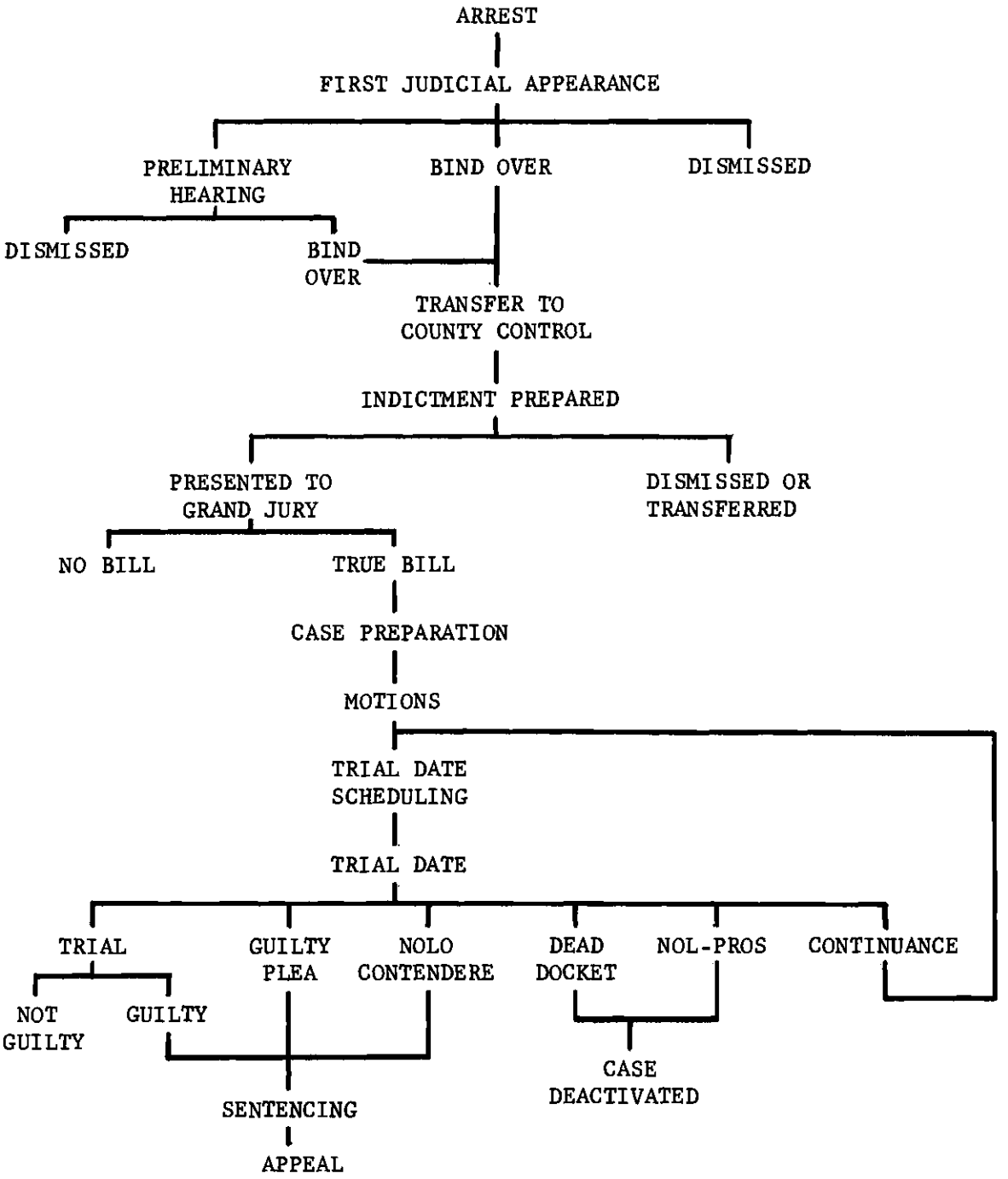


Figure 1. Real World Procedure

Normally the preliminary hearing is waived by the defendant and he is bound over to Superior Court.[9]

Upon bind-over, the defendant is physically transferred from the municipal jail to the Fulton County Jail. When the defendant arrives at the county jail, the municipal police departments notify the District Attorney (D.A.) as to the particulars in the case. It is the responsibility of the D.A. to prepare an indictment against the defendant and then present it to the Fulton County Grand Jury. It is interesting to note that not all defendants who are bound over are presented to the Grand Jury (G.J.). During 1970, 585 cases[10] were either dismissed or transferred to other courts without presentment to the G.J.[11]

The Grand Jury has the responsibility of determining whether there appears to be enough evidence to bring the defendant to trial. The defendant, except in rare cases, does not appear or have legal representation before the G.J. After a case has been presented, the G.J. can return either a "true bill" or a "no bill." An indictment returned as a true bill means the G.J. believes the case should be brought to trial, while a no bill means the case will be dismissed.[12]

Grand Jury Indictment to Initial Disposition

General

It is the time period between the Grand Jury's return of a true bill to the initial disposition of a felony case that this model seeks to represent. For that reason, the actions which take place during this period will be described in greater detail. Primarily, these actions which cause the defendant to move through the system involve three groups,

the Superior Court Judges, the District Attorney's office, and the Superior Court's Criminal Clerk's office. The actions of each of these groups will be described separately below; however, it must be kept in mind that there is a continual interaction between all three groups.

Criminal Court Clerk

The first in depth look will be into the actions of the Criminal Court Clerk's (C.C.C.) office. As the name might imply, this office is responsible for maintaining all of the Superior Courts' official records. These records include the criminal docket, the case files, the calendars, and any other records which must be kept in conjunction with processing a case. Under the supervision of the court, the clerk also prepares the calendar. In preparing the calendar, the clerk is the one person mainly responsible for determining the exact date the case will be brought to trial and the judge who will preside over it. In addition to the duties just discussed, the clerk and his staff perform many other duties which are not relevant to this thesis and will not be discussed.

The C.C.C. first sees a case after the Grand Jury has acted on the indictment. The original of four copies is maintained by the clerk. The clerk's first action is to divide the true bills into one of the following three groups: jail cases, bond cases, or non-arrest cases. The next step is to assign each of these a continuous, sequential case number regardless of the type of offense or jail-bond-non-arrest status. The case number, defendant's name, and offense are entered into the criminal docket. After the information has been recorded, these true bill indictments are placed with other active files according to current status.

When the time arrives to prepare a calendar, the C.C.C. goes to

the active files and screens all cases to determine which defendants, in jail or on bond, are not scheduled on some future calendar. Having ascertained this information, the clerk then schedules these defendants based on a fairly rigid set of priorities. First priority goes to all jail cases. This priority is assigned because of the overcrowded conditions in the Fulton County Jail. There is no legal requirement for this priority; however, it is done under the court's direction to keep the overcrowding to a minimum. Among the jail cases, the oldest active unscheduled cases are scheduled first. When all jail cases have been scheduled, the oldest active bond cases are added to the calendar until all available spaces have been filled.

The Superior Court judges tell the C.C.C. how many defendants to schedule using the following procedure. Prior to the end of a term of court, which lasts approximately two months, the judges have a meeting to determine who will sit in the Criminal Jury Division during the next term. Normally, three or four judges will be assigned and the C.C.C. will prepare a calendar for each of them. Prior to the preparation, the Presiding Judge of the Criminal Division advises the clerk as to how many defendants to place on each day of the calendar. Normally 12 to 15 defendants are scheduled on Monday through Wednesday, 8 to 10 on Thursday, and no defendants are scheduled for Friday. Thus, it is a simple matter to determine how many defendants to schedule on each calendar.

The only remaining variable is to determine whether to prepare the calendar for one or two weeks. Usually it is prepared two at a time, two weeks in advance. However, during late summer and early fall, when the jail population is the largest, the calendar may be prepared one week

at a time. This is done with the intention of giving the fastest possible service to jail defendants.

When the actual steps are taken to prepare the calendar, the C.C.C. prepares one work sheet for each judge, for each week. Using the priority discussed earlier, an attempt is made to divide the various types of cases equally among all the judges. Besides the previously established priorities, further attempts are made to segregate the offenses. More serious crimes are usually assigned during the beginning of each week in an attempt to provide the concerned parties with the maximum amount of time to dispose of the case.

In rescheduling continued cases, every effort is made to have that case follow the District Attorney trial lawyer who had previously handled the case. As a result, this usually means that the same judge will not see the defendant two times in a row and perhaps never again.

The procedure outlined above is the one normally followed to prepare a regular calendar. In addition to this calendar, two types of plea calendars may be prepared. The easiest of these to describe is the calendar prepared for jail plea cases. Through personal visits to the jail, the C.C.C. determines if there are any defendants who desire to plead guilty to their charge and thus seek early disposition of their case. When these individuals have been identified, their names will either be added to the earliest possible regular calendar, or a special calendar will be prepared for a judge who has agreed to hear them. This procedure is a rapid and easy method for disposing of cases while at the same time helping the jail problem. This type of calendar has been used sparingly in the past, except during the July-August terms. During this term,

because of the judges' vacations, greater efforts are made to reduce the jail backlog.

The second type of plea calendar is the one used to expedite bond cases. When a true bill is returned by the G.J., the District Attorney's office also gets a copy of the indictment. The more experienced lawyers on his staff review these indictments and, based on their experience, try to predict which defendants will plead guilty rather than ask for a trial. A list of those defendants, including both jail and bond cases, is forwarded to the C.C.C. Because of the high priority already given to jail cases, this list is not normally used to aid in scheduling jail defendants. However, since mid-1970, increasing efforts have been made to use the list for bond cases.

Normally when this type calendar is prepared, 20 to 30 bond defendants from the D.A.'s list are scheduled for a Thursday, before one of the more experienced judges. On the scheduled date, no attempt will be made to try a case but just to determine if the prediction was correct. If the defendant does want to plead guilty, the judge hears his plea and the case is disposed of at that time. If the D.A. lawyers were wrong, the case is continued and in the future will be treated like any other non-plea case.

This screening technique has two main advantages. This first advantage stems from the low priority given to bond cases. Frequently, the bond defendant has to wait twice as long as his jail counterpart to have his case disposed of. The use of the plea bond calendar allows the state to move these bond cases much more rapidly amd it affords the defendant an opportunity for an early disposal of his case. The second advantage is

primarily an economical one, if the defendant does in fact plead guilty. In anticipated plea cases, further investigation into the case is greatly reduced and the D.A. does not subpoena any witnesses, and both of these actions would have cost the state money. Of course, if the defendant does not plead, this work must be done.

As stated earlier, the idea of a plea bond calendar is a relatively new innovation. However, the success of this technique has been great enough to cause its usage to be expanded. Presently this type of calendar is being used very frequently.

In addition to the docket and the calendar, the C.C.C. is also responsible for maintaining the case files. The original copy of the indictment serves as the nucleus for this file. As the case progresses and further information becomes available, it is placed with the indictment. The exact nature of this additional information will be discussed later in the chapter on sample data.

In conclusion, it can be seen that the position of Criminal Court Clerk is very important. This person is not only responsible for maintaining the official records of the Superior Court, but can greatly affect the time a defendant spends in the system between Grand Jury indictment to the initial disposition of his case.[13]

District Attorney

Another important group, involved with processing a defendant while he is in Superior Court, is the District Attorney and his staff. As mentioned earlier, the first action taken by the D.A. after indictment is to screen all the cases in an attempt to determine which defendants will probably plead guilty. Since it has already been pointed out the path

that the plea cases follow, let us direct our attention to the remaining approximately 75 percent of the defendants. These are the defendants the D.A. feels may request a trial.

Initially, all possible trial cases are sent to the D.A.'s investigative division. This division consists of former policemen, law students, and other non-lawyers whose job it is to run down the additional facts and witnesses necessary to prosecute the case. This group does the leg work, so that by the time a D.A. trial lawyer gets the case, he has only to review the facts and add any final refinements.

While the investigative division is working on the case, the C.C.C. is also preparing to schedule the case. Prior to publishing the final calendar, the clerk must know which assistant D.A. or trial lawyer will be assigned to the case. This information is provided by the District Attorney himself. Normally, eight to ten lawyers of the D.A.'s staff are assigned to the trial division. This group of lawyers handles the prosecution of all defendants before the Superior Court judges. Usually, one trial lawyer works with one judge one week at a time, i.e. one particular assistant D.A. will prosecute all of the cases scheduled before a particular judge for one calendar week. When an attorney is assigned to the trial division, he normally works one week in court prosecuting cases and the next week out of court preparing for the upcoming week.

During the out of court week, the trial lawyer's first step is to check with the investigative division to see if their work has been completed. If it has not, he tries to hurry them along or takes the case over himself. Part of the preparation stage is deciding how to prosecute each defendant. Since one trial lawyer is responsible for prosecuting one

judge's weekly calendar, he must prepare 12 to 15 cases Monday through Wednesday and 8 to 10 on Thursday. Of that total group, 6 to 10 cases a day will be possible trial cases. At most, the assistant D.A. can try three to four defendants a week. The remaining defendants' cases must be settled by plea bargaining, dead docket, or continuance.

The endeavor known as plea bargaining is an attempt on the part of the trial lawyer and usually the defense attorney to reach an agreement whereby the defendant pleads guilty. This is normally attained by the assistant D.A. allowing the defendant to plead guilty to a lesser offense and/or offering to recommend a sentence which is less than maximum for the offense. This practice, which has received considerable attention lately, is used extensively in Fulton County.

When a case is put on the dead docket, it normally means the case is too weak to try. This act in effect indefinitely postpones the case. If the defendant is in jail he is released and if he is out on bond he is released from his bond. Legally the case can be reactivated at any time within the statute of limitations of the offense for which the defendant is charged.

Finally, if the trial lawyer cannot reach an agreement during plea bargaining, does not want to dead docket the case, and does not have time to try the case, he can ask the judge for a continuance. In effect he is requesting permission to temporarily postpone the case. A more detailed discussion of this aspect of the system will be given a little later.

In conclusion as was in the case of the C.C.C., the District Attorney and his staff play a very major role in determining how long a defendant will be in this part of the criminal justice system. This office

also greatly influences the final disposition of the case.[14]

Superior Court Judges

Perhaps the most obvious influential group affecting the disposition of felony cases are the Superior Court judges. Each year since 1956 there have been nine publicly elected Fulton County Superior Court judges. Recently one more judge was appointed, bringing the total to ten. Theoretically, each of these judges rotates through the various divisions of the court. These divisions include:

1. Presiding Judge, Civil Division
2. Civil Jury Division
3. Civil Non-Jury Division
4. Domestic Relations Division
5. Criminal Jury Division
6. Any other Division as may be determined by the Chief Judge.[15]

Realistically, most judges spend the majority of their time in the division of their choice.

As mentioned earlier, prior to the end of a term of court, the judges have a meeting to decide what their duties will be for the next term. A term of court lasts approximately two months and starts the first Monday of every other month. In addition to the judges, a particular Grand Jury sits for one term of court.

The division of court which handles felony cases is the Criminal Jury Division. During the last year and a half, three or four judges have been assigned to this division. However, not all of these judges were Fulton County judges. In fact, during the last two terms of court in 1970 and the first two terms of 1971, approximately half of the judges

serving in the Criminal Jury Division were ones not elected by the people of Fulton County. The judges were either retired emeritus judges or men elected to serve in other circuits. While the use of these types of judges was common in the past, efforts are now being made to eliminate the need for their services. This change came about as a result of criticism that these judges were not as responsive as the judges elected in Fulton County.

Each judge assigned to the Criminal Jury Division is supposed to hold court every Monday through Thursday. Normally, Friday is reserved for non-jury business such as hearing motions, probation revocations, and other matters which can be handled without the need of a jury. Court is held every week of the term except for the last week, which is supposedly reserved for administrative business. Also in the past, court was held on a very limited scale during the July-August term. During 1970, this term of court contained nine possible trial weeks; however, court was held only during two weeks and even then on a reduced workload. During this same period, one judge did preside over a jail plea calendar for three days. In addition to the July-August term, the November-December term is shortened by an extra week for Christmas.

Prior to the arrival of the scheduled trial date, judges may hear motions pertaining to felony cases. These motions could include those for quashing the indictment, securing bail in capital cases, suppressing evidence, motion to sever, or asking for a change of venue. The motions are normally heard by the Presiding Judge of the Criminal Division or by the Judge in Chambers. The state is represented during these motions by a lawyer from the D.A.'s staff.

When the trial date does arrive, a typical day is handled in the following manner. Initially, at 9:30 A.M., the judge calls the entire calendar for that day to insure all necessary parties are present. After the determination of any bond forfitures, the judge normally grants any uncontested motions for continuance by either the state or the defendant. Normally, it is not very difficult to get a continuance either at this point or following the recess. Following this initial session of court, a short recess is called for the purpose of holding pre-trial conferences. During this time, the assistant D.A., the defense attorney, and sometimes the judge attempt to work out any last minute pleas or motions in order that the cases may be disposed of on that day. When court reconvenes, the first order of business is to dispose of those cases where the defendant has decided to plead guilty. Following the disposal of the plea cases, the judge then turns his attention to any remaining cases where the defendant wants a trial, either jury or non-jury. If more than one defendant desires a trial, the assistant D.A. has the opportunity to decide which one to proceed with.

The judge has several options open to him in deciding how to handle any other remaining cases. He can reset those cases for later that week in hopes that there will then be an opportunity to try them. The judge can attempt to have the case transferred to another judge who is not busy. Finally, the judge can continue the case, temporarily postponing it to a later date.

The entire procedure outlined above represents a rather typical day in the Criminal Jury Division of the Fulton County's Superior Court. However, one should realize that there will be variations depending on

the particular individuals involved.

Finally, it should be apparent that theoretically the Superior Court judges have the most influence of the three groups just discussed. They are the final authority for determining how many defendants are scheduled on a calendar; they are the final authority for granting motions including continuance motions; the judge has the final say in the disposition of the case regardless of the agreement between the D.A. and the defense attorney; and the judge controls how each case is handled in his courtroom. However, whether every Superior Court judge exercises his authority in a proper manner has been a topic for debate in recent months. While there is a certain disparity between the powers of these three groups, to operate efficiently they must work in harmony with each other.[15]

After Initial Disposition

After the defendant has been initially sentenced at the Superior Court level, he has the right to appeal the decision. There are several routes the appeal might take. First of all, the defendant could present a motion to retry the case at Superior Court level. If this fails, he could appeal the case through the State appellate courts. Finally, as another alternative, the defendant could appeal his case through the Federal trial and appellate courts. This thesis does not intend to model this part of the system.

CHAPTER III

SIMULATION MODEL

General

As a result of the preceding discussion, it is felt that the reader will have gained sufficient knowledge about the real world system to more fully understand the model designed to represent it. The model itself was written in the computer language known as General Purpose System Simulator II or GPSS II. This is a user oriented language designed primarily to simulate an object flowing through a system. Since the model intends to simulate the flow of a defendant through the judicial system, it is felt that GPSS II will be quite adequate.

As stated earlier, the objective of this simulation was to model the actions involved in processing a felony case from the time the Grand Jury returns a true bill to the initial disposition of that case at the Superior Court level. To do this, the model was developed in four stages. The first stage was the generation stage designed to place the proper number of defendants into the system at the proper time. The second stage was the scheduling stage designed to place the defendants on one or more various types of calendars. The third stage was designed to model the possible ways of disposing of a case on its scheduled trial date. The final stage was the data collection stage designed to provide the necessary data to validate and effectively modify the model.

The following description of the computer simulation model is an attempt to describe a rather large and complex program without discussing each and every block, function, or variable statement in detail. It is the opinion of this author that a reader with a knowledge of GPSS II can, with the use of the Appendix, follow the exact structure of the model. It is also felt that a person without a knowledge of GPSS II can understand the basic functioning of the model without being lost in a maze of technical jargon. However, in order for a person without a knowledge of GPSS II to better understand the description that follows, it is necessary to define three terms: a block, a function, and a variable statement.

As a transaction representing a real world defendant enters the model, the computer processes it by moving it from block to block. There are many types of blocks and their purpose is to perform operations in the model similar to those actions which take place in the real world. For example, certain blocks cause new transactions to enter the system, other blocks assign various characteristics or parameters to the transactions, such as offense type, jail-bond status, etc., and still other blocks serve to route the transaction through different sequences representing the real world possibilities.

A function is a mathematical device used by the blocks to derive a specific result, when that result can take on more than one value. A block feeds certain input into the function, such as clock time, a parameter value, or a random number. Based on that input, the function sends the desired output back to the block. For example, in determining whether a particular transaction will be continued or not, one of the functions between 75 and 94 is used. When the transaction arrives at the block

where this information is needed, the block refers to that one function out of 20 representing that transaction's offense and jail-bond status. Since the continuance rate is also based on the number of times through the system, the parameter containing this information serves as input to the function. The function, based on sample data, already knows what percentage of this type offense and jail-bond status will be continued each time it comes up for trial. Therefore, using the input, the function returns the continuance rate as output to the block. Based on this percentage, the block then determines which route the transaction will follow.

Finally, a variable statement is just an algebraic equation, such as X + Y. The blocks cause the values for X and Y to be fed into the variable statement, which in turn performs the operation and returns the answer to the block. With these definitions in mind, let us now turn our attention to a more detailed look at the model.

Generation Stage

The overall objective of the generation stage is to represent the actions of the Grand Jury. In other words, this stage is designed to put the proper number of different defendants for each type of offense into the system. In order to simplify the problem, the wide variety of different offenses was placed in one of the eleven categories listed below:

1. Murder
2. Burglary
3. Robbery (includes armed robbery)
4. Aggravated Assault

5. Forgery
6. Larceny
7. Sex Offenses (rape and sodomy)
8. All Misdemeanors
9. Narcotic Offenses
10. Motor Vehicle Theft
11. Other Felony Offenses (arson, gambling, kidnapping, etc.)

Category 11 is designed to include a wide variety of small volume felony offenses. The offenses above are coded with the number to the left of that offense, and where possible the GPSS II program and the sample data follow this numeric designation.

Ten similar generation systems are the heart of the generation stage. Each system is designed to handle one of the ten different felony offenses. For a reason to be discussed later, no misdemeanor offenses are generated. These ten different systems include Blocks 1 through 199 of the computer program. Each new system starts every 20th block, e.g. Blocks 1 through 20 represent the murder system, 21 through 40 the burglary system, 41 through 60 the robbery system, and so forth.

The purpose of the 1, 2, and 3 blocks in each system is to place the proper number of indictments for each offense into the system at the proper time. Specifically, Functions 1 through 10 are used to designate the approximate number of indictments which will enter the system during a particular term of court. It is assumed that the number of indictments returned by the Grand Jury will follow a uniform distribution based on historical data for that term.

After the proper number of indictments has entered the system, each is coded to designate the type of offense and also the jail-bond-non-arrest status. Functions 11 through 20 are used to assign the jail-bond-non-arrest status and are based on historical data. These transactions take place in the 4 and 5 blocks of each system.

Even though at this point we have a proper number of indictments, there is no information concerning the number of defendants these indictments represent. It is quite common to have more than one defendant on an indictment. For that reason, the 6 block uses Functions 21 through 30 to determine how many defendants will be on that indictment. Again, these functions are based on historical data. Once the number of defendants has been determined, a series of Blocks, 260 through 290, create the proper number of total transactions in the system to represent the total number of defendants indicted by the Grand Jury.

At this point in the program, the proper number of total defendants has been generated. However, this is more than the desired amount. The reason for this is due to the fact that some defendants are indicated at the same time for more than one offense. Sometimes these multi-indictment defendants are indicted for the same type offense, but perhaps more frequently they are indicted on several different types of offenses. Thus, at this point there are too many different defendants in the system. The reason this is so important is because, when the C.C.C. prepares the calendar, he schedules all indictments against a single defendant at the same time. As an example, take the case of a defendant indicted on two charges of armed robbery, one charge of aggravated assault, and a mis-

demeanor charge for possessing a gun without a permit. This defendant will occupy only one available space on the calendar, not four. Therefore, the model must remove a certain number of the total defendants to have the desired amount of different defendants. The determination of this elimination percentage will be discussed in detail in Chapter IV. Suffice it to say that, following the 7 block of each system, the proper number of different defendants is placed in the system.

The 8 block was initially designed to assign the time from arrest to indictment to one of the transactions parameters; however, because of a lack of sufficient data at this time, this block was not used. When this information becomes available, it will be a simple matter to add it there. The 8 block also serves to route the transactions according to their jail-bond-non-arrest status. The non-arrest transactions go to Blocks 313 or 314 and will be discussed later with the bond forfitures.

Those transactions representing jail defendants will enter the 10 block. Here a certain percentage based on historical data will be designated possible jail plea transactions. This function is designed to represent the post indictment screening conducted by the District Attorney's staff. Following this screening, each jail transaction is assigned a priority high enough to insure that it will be scheduled prior to any bond transactions. At this time, the jail transaction leaves the generation stage and enters the scheduling stage.

Those transactions representing bond defendants have a similar screening process designating some of them as bond plea transactions. In addition, it was decided to use this stage of the model to designate a

certain percentage of these transactions as bond forfiture transactions. While this information will not be used until the disposition stage, this was the most convenient place to handle it. Following this, each bond transaction is assigned a very low priority and routed to the scheduling stage.

These blocks alone do not describe the entire generation stage. In addition, Blocks 220 through 257 are used. Blocks 220 through 232 are used only once to prepare the proper initial conditions to start the generation stage. Blocks 235 through 257 determine the times and number of initial transactions to be placed in this stage. Specifically, these blocks fed a certain number of transactions into each of the ten generations systems every Tuesday and Friday that the Grand Jury met during the year of 1970 and the first term of 1971. Once these blocks have placed the transactions in each system, it is up to that particular system to create the proper number of different defendants.

Scheduling Stage

The objective of the second stage of the model is to schedule the defendants for their initial trial date and any subsequent trial dates. It is intended that this portion of the model will simulate the functions performed by the C.C.C.

After departing the generation stage, all transactions go through Blocks 395 and 396. The purpose of 395 is to assign a time to the transaction representing the time of entry into the system. Block 396 codes the transaction in such a manner as to indicate to the remaining blocks that this is its first time through the system.

From this point, the transaction goes to Block 401, the scheduling queue. The transaction will wait in this queue until it is scheduled for a specific trial date. It is the purpose of Blocks 450 through 507 to remove transactions from this queue. The amount, type, and time of removal depend on the various types of calendars prepared during 1970 and the first term of 1971.

Blocks 450 through 470 serve to remove the proper number of transactions necessary to create a regular calendar in which jail defendants are given priority. Block 451 and Function 60 determine when and how many total transactions will be removed to prepare a single regular calendar.

Blocks 454 through 461 and Functions 61 through 68 determine how many of the total transactions will be scheduled on each day of the calendar. All of these functions will be based on historical data. Blocks 462 through 465 serve to print out prior to each calendar preparation, the number of transactions in the scheduling queue and the date. Block 470 actually removes the proper number of transactions from the queue and sends them to Block 403.

From 403 a transaction goes to Blocks 410 through 437 which serve to schedule the transaction for a particular date and hold it until that date arrives. Blocks 410 through 425 attempt to place a uniform variety of offenses during each week of the calendar. Blocks 430 through 437 hold the transaction until the scheduled trial date.

Blocks 471 through 485 are designed to schedule the various bond type calendars used during the simulated time period. During this period, three different types of bond calendars were prepared. These types included plea bond only, regular bond only, and a combination of the two.

Initially, Block 471 using Function 70 determines if there will be a special bond calendar that week and, if so, how many transactions will be on it. Block 476, in conjunction with Function 71, designates the type of calendar it should be. The remaining Blocks, 477 through 485, remove the proper number of the designated type bond transactions from the scheduling queue. Plea bond transactions are then placed in Block 439 and regular bond placed in Block 440.

Block 439 codes the plea bond transactions so that they will be disposed of as such. From 439 these transactions join regular bond transactions in Block 440 to determine what day of the week these cases will appear. Using Function 72, Block 440 determines this information and routes the transaction through Blocks 441, 442, or 443 to their scheduled court date. These dates correspond to those used in preparing the regular calendar and thus these transactions may be sent to those blocks to wait the proper amount of time.

The bond transactions discussed above were in all instances added to a regular calendar. However, during one week of 1970, the entire schedule consisted solely of bond cases. This one week is represented by Blocks 487 through 490. Block 487 determines the time to prepare this calendar. Blocks 486 through 489 remove from the scheduling queue the correct number and type of bond transactions scheduled during that week. Once the transactions have been removed from the queue, they are routed through Block 445 which designates the trial date.

Finally, there was one more type calendar prepared during 1970, the jail plea calendar. Blocks 498 through 510 handle this limited number of transactions. Blocks 496 through 500 determine the dates the

defendants were scheduled, while Blocks 502 through 506 determine and remove from the scheduling queue the proper number of transactions. Block 510 assigns the trial date and causes these transactions to wait the proper number of days prior to that date.

This last discussion about the jail plea cases concludes the scheduling stage of the model. From this point, all transactions go to Block 520, the beginning of the disposition stage. However, one should bear in mind that a transaction may go through the scheduling stage more than once if it is continued.

Disposition Stage

The disposition stage is designed to simulate the possible events which could happen on the day the defendant is scheduled for trial. This stage also represents what happens to those cases which are continued and have to be rescheduled.

Once the transaction reaches the disposition stage, it is divided into one of four categories: regular bond, regular jail, plea bond, or plea jail. After the major category has been determined, each transaction moves through a routing sequence designed specifically for that category.

Initially, Block 520 routes the transactions into one of the four sequences. If the transaction represents a bond plea defendant, it goes to Block 521 and is further routed through Blocks 526 and 527. At Block 521, a certain percentage of all transactions, regardless of offense, is designated bond forfitures and sent to Block 300. Of the remaining transactions, again a certain percentage, regardless of offense, is disposed of the first time through the system. The remaining transactions are sent

to one of the blocks between 331 and 340 to start the rescheduling process as regular bond cases. Those transactions which are disposed of are sent to the data gathering stage.

The regular bond transactions are initially sent to Block 522 where they are routed through Blocks 525, 528, and 531 through 570. From 522, a transaction is either sent to 525 or 528, depending upon its bond forfiture status previously assigned. Bond forfitures go through Block 525 on their way to Block 300. Block 528 routes the remaining transactions by type of offense and sends them to one of the blocks between 531 and 540. From these blocks the transactions go to one of the blocks between 541 and 550. The purpose of these blocks in conjunction with one of the functions between 75 and 84 is to determine whether the transaction will be continued or disposed of at this time. This decision is based on the number of times the transaction has been through the scheduling stage and the bond continuance rate for that particular offense. If the transaction is disposed of, it goes to the data gathering stage, if not, to Blocks 350 through 355 to be rescheduled.

Jail plea transactions are handled similar to bond plea transactions except that there can be no bond forfitures. These transactions initially go to Block 523 and from there, depending on a certain percentage, are either disposed of or sent back to be rescheduled as a regular jail case. Again, in the plea category, this percentage is the same regardless of the type of offense. Block 529 receives continued transactions and changes their category from jail plea to regular jail. The transaction is then sent to one of the blocks between 331 and 340.

The final category in the disposition stage is that of regular jail. These transactions are treated in exactly the same manner as regular bond with the exception that there are no bond forfitures. Blocks 561 through 580 and Functions 85 through 94 handle this process. Again, the determination as to whether a transaction is continued or not depends on the jail continuance rate for that offense and the number of times the transaction has been through the scheduling stage.

The discussion about the regular jail cases does not complete the disposition stage. Those transactions which were not disposed of must be completely processed to route them back to the scheduling stage.

The easiest categories are those concerning the regular jail and regular bond transactions. Initially, all defendants are sent to one of the three blocks between 350 and 352 where Variable Statement 15 is used to determine their new priority. This step is performed to enable the model to simulate the C.C.C.'s practice of scheduling the oldest case first. The new priorities are still such that all jail transactions take precedence over bond transactions. Block 353 assigns the new priority while Block 354 increments the parameter monitoring the number of times through the scheduling stage by one. Finally, Block 355 insures that no transaction which has been through the system once will be disposed of as a plea transaction.

The plea transactions are handled similarly, except they must first go through one of the blocks between 331 and 340 to determine the type of offense. This is done to add the proper priority to that transaction. The plea transactions are then sent to one of the blocks between 350 and

352 and from there follow the exact path outlined for regular transactions.

Once a transaction, jail or bond, plea or regular, has gone through Block 355, it is placed in the scheduling queue of the scheduling stage. From this point, rescheduling will follow the procedures outlined earlier for initial scheduling.

Thus, disposition of all types of transactions with the exception of bond forfitures and non-arrests have been discussed. The real world processing of each of these types of defendants is very similar in that in both situations the defendant has left the immediate control of the courts. While it is desired that both types reenter the judicial system as soon as possible, it is primarily up to the police to control their reentry. It has been found from the sample data, the reentry times vary from one day after departure to infinity, i.e. they never reenter. Based on the results of the sample data, it will be assumed that there are two rates of reentry for both the bond forfitures and the non-arrests. These two rates in each category will represent one high reentry rate and one low reentry rate. The exact distributions for these four functions will be discussed in Chapter IV.

In the model, transactions representing non-arrests go to either Block 313 or 314. Offenses judged to have a high arrest rate after indictment are sent to 313, while offenses with low arrest rates go to 314. In conjunction with either Function 53 or 54, a probable time is determined before the transaction enters the system. If that time exceeds 200 days, it is assumed the transaction will not enter and it is terminated. Those transactions with entry times of less than 200 days are sent to Block 316

to wait the prescribed amount of time. Following this waiting time, the transaction is routed through one of the blocks between 321 and 330, depending on the type of offense. These blocks in turn route the transaction by offense back to the last part of their respective generation systems. The transactions are routed to either a jail or bond sequence, depending on the type of offense. Once they have returned to the generation stage, they proceed as any other jail or bond transaction.

The theory behind processing the bond forfiture transactions is exactly the same as the non-arrest transactions; however, the exact routing is slightly different. A bond forfiture transaction goes to Block 300 where it is then routed to one of the blocks between 301 and 310, depending on the type of offense. From there it is sent to either 311 or 312, depending on whether that offense has a high or low rearrest rate. High rearrest rates go through Block 311 using Function 51 to compute the time to rearrest, while others go through Block 312 using Function 52. Following the determination of the times to rearrest, the transactions are handled exactly like the non-arrest transactions using the same blocks to wait and then reenter the generation stage.

Thus, one can easily see that the disposition stage serves not only to dispose of a transaction and handle continuances, but also processes transactions representing bond forfitures and non-arrests. Eventually every transaction which does not exit the system by way of the non-arrest or bond forfiture route will depart the disposition stage for the data gathering stage.

Data Gathering Stage

The final stage of the model is the data gathering stage. This stage itself plays no part in simulating the real world system, but it is there to enable the researcher to validate the model and interpret the effects of any future modifications. One portion of the data gathering stage has already been discussed and that was the section which prints out the number of transactions in the scheduling queue and the date they are there.

Another portion of the data gathering stage records the time it takes a transaction to move through the system from time of indictment to the time of initial disposition. These times are broken down by type of offense and jail-bond status of the transaction. In all, there are 20 tables which record the 20 possible combinations of offense types and jail-bond statuses.

In the model, when a transaction departs the disposition stage and enters the data gathering stage, it is routed through one of the blocks between 651 and 670. The specific routing depends on the offense and jail-bond status. These blocks record the time data and print them in Tables 1 through 20. Regular jail and regular bond transactions go straight to these blocks; however, plea transactions must go through certain additional steps. Plea bond transactions initially go to one of the blocks between 601 and 610 and finally to one of the blocks between 651 and 660 to be recorded. Jail plea transactions initially go to one of the blocks between 601 and 610, then through one of the blocks between 611 and 620 and are finally recorded in one of the blocks between 661 and

670. The reader will recall that plea transactions are handled on a percentage basis, regardless of the type of offense, and thus this lengthy process must take place to insure that each transaction is recorded in the proper table.

Finally, the astute observer will note that the process for handling jail and bond burglary transactions is different. This difference results because of the manner in which the system was initialized. This initialization procedure will be discussed next.

Model Initialization

Prior to terminating the discussion of the model, some mention should be made about the efforts to properly initialize the system. It was designed to simulate a time period starting at the beginning of 1970 and running through the first term of 1971. It is logical to assume that, to start the system properly, there should be some defendants in it carried over from 1969. In fact, one should expect to have some 1969 bond cases waiting to be scheduled for the first time. In addition to these cases, some defendants which were scheduled in late December for trial in early January would be continued and returned to the scheduling queue. Using data gathered from the Clerk's office, it is possible to determine approximately how many defendants were in the queue the first time a calendar was prepared in 1970. Subtracting from this figure the number of defendants one expected the generation stage to feed into the system by that first scheduling date, it could be determined approximately how many defendants should be artifically added to the system to create the proper initialization conditions. In addition, one could also use an overall

continuance rate to feed the proper number of continued cases into the system for rescheduling.

Specifically, Blocks 205 through 216 handled this problem of initialization. Blocks 205 and 210 generate the proper number of jail and bond transactions, respectively. Blocks 215 and 216, respectively, generate the proper number of jail and bond transactions which would enter the queue at a later date for rescheduling. The remaining blocks serve to assign the proper values to the various parameters to enable these transactions to progress through the system. By virtue of the fact that burglary transactions most closely correspond to the overall average continuance rate for both jail and bond cases, these initialization transactions were labeled as burglary offenses. However, in order that these transactions would not interfere with data collection, an additional parameter was assigned so that these transactions could be removed from the system prior to recording the time data. This additional aspect of the model is why the recording of burglary data is structured differently. Blocks 652, 662, and 750 through 756 serve to remove these initialization transactions. The burglary data recorded and found in Tables 2 and 12 are only for those transactions generated since the beginning of 1970.

Conclusion

As mentioned at the beginning of the model description, this has not been an attempt to discuss every minute aspect of the model in detail. The objective has been to provide enough information so that a reader may take away from the model the amount of detail he desires.

CHAPTER IV

SAMPLE DATA

General

In the discussion of the computer model, several references were made about using sample data to determine the classification and routing of various transactions. To obtain all of the necessary data for accurate model construction required many hours of tedious and painstaking work. The reason data collection was so difficult was because every usable statistic had to be obtained by first analyzing raw data. Presently, there are virtually no statistics available to the public, other than rough volume figures. There was some mention of the fact that the District Attorney had collected some statistics for use in earlier studies; however, efforts to obtain these data were unsuccessful. Thus, every statistic used in this thesis came from raw data gathered especially for this research.

Almost all of the raw data were gathered in the office of the Criminal Court Clerk, primarily because this is where the official records are kept and most of these records are available to the public. In connection with this data gathering, the Clerk and his staff afforded this researcher every assistance.

The bulk of the data came from one of the following official records: the criminal docket, official case files, and past calendars. Limited use was made of other records and this will be discussed at the

time the data are presented.

Criminal Docket Data

Initially, let us look at the information gathered from the criminal docket. The docket contains the following information concerning felony indictments:

1. Name of defendant
2. Indictment case number
3. Offense
4. Date of indictment
5. Disposition and sentence, if applicable.

This particular record is an excellent and rapid reference to cross check possible gross errors.

The docket was initially used to provide information concerning the volume of each type offense indicted by each Grand Jury during 1970 and the first term of 1971. To obtain this volume data, every indictment was placed in one of the 11 offense categories discussed earlier and segregated by term of court. This information was used in the first step of the generation stage and a compilation of the data is presented in Table 1.

Since time would not permit the examination of each and every case file, a certain sample had to be selected from the total. The information gained from the docket aided in the selection of these sample cases. It was decided that it would be desirable, time permitting, to investigate between 5 and 10 percent of all of the 1970 indictments. Since there were 4,619 indictments during this year, the goal was to attempt to sample 400

Table 1. Real World Indictments

Offense Category	Number of Indictments by Term of Court						
	J-F 1970	M-A 1970	M-J 1970	J-A 1970	S-O 1970	N-D 1970	J-F 1971
1	28	23	23	27	27	24	25
2	108	109	79	102	63	94	117
3	55	79	43	52	66	53	81
4	69	83	95	123	73	87	95
5	59	61	52	63	81	57	66
6	94	105	95	108	77	94	116
7	8	17	19	22	15	20	10
8	43	111	91	98	67	83	84
9	67	91	127	124	152	114	111
10	76	59	89	74	63	50	83
11	67	68	48	69	95	51	28
TOTALS	684	806	761	862	779	727	896

case files. Rather than selecting an equal number of cases for each offense category, it was felt that the number investigated should be proportional to the number of indictments for those types of offenses. Further, it was decided that the proportionality would be based on a term of court rather than yearly volume. Therefore, to determine how many case files to examine of a particular offense for a specific term, one would multiply 400/4619 times the number of cases of that type offense during that term. Once this number was ascertained, a table of random numbers was used to specifically select which case files would be investigated. As an example, there were 94 larceny cases indicted in the January-February term of 1970. Based on the multiplication factor, it was determined that eight of these indictments would be examined. To determine which eight files out of the 94, eight random numbers between 1 and 94 were chosen. Using these eight numbers and the previous information taken from the docket, the specific case files were identified.

Because of several factors, this scheme had to be slightly modified. The time required to examine only one case file averaged between eight and ten minutes. As a result of this time factor, only 320 cases were examined. Fortunately, actions had been taken to plan for this possibility. Starting with the January-February term, only every other identified file was examined. This process insured that, if the entire goal was not reached, there would at least be a cross section of cases for the entire year. Once this first sample was taken, efforts were made to examine the remaining case files again starting with the January-February term. This final sample was never completed.

A further modification had to be made with regard to the lower volume felony offenses. As stated earlier, the plan was to investigate the number of case files of a certain type of crime based on its volume during a particular term of court. It was found that, for certain offenses, primarily murder, forgery, and sex offenses, the sample sizes were going to be quite small. For this reason, a minimum of four case files was selected to be examined for each type of offense for each term.

Case File Data

Using the modified scheme outlined above, the designated case files were examined. A complete case file for a closed case should have the following information:

1. Detailed description of the offense
2. Date of the offense
3. Number of defendants
4. Date of indictment
5. Jail, bond, or non-arrest status
6. Police record with:
    a. arrest date
    b. bind over date
    c. previous offenses
7. All scheduled trial dates including the criminal division and the Assistant District Attorney scheduled to prosecute
8. Defense attorney
9. Record of bond, if applicable
10. Transcript of trial

11. Final disposition of case with sentence and/or fine, if applicable

12. Other information relevant to the case.

As one might expect, a wealth of knowledge can be gained from a completed case file. However, more often than not, the file is missing one or more of the above items. Things that one can be reasonably certain of finding are the original copy of the indictment with items one through four on it.

Using the data from the case files, certain interesting and very necessary statistics can be generated. Of first concern to the model is the percentage of defendants by type of offense which are in jail, on bond, or not arrested at time of indictment. These percentages were computed and are presented in Table 2. This information is used in the generation stage of the model.

Table 2. Status of Sampled Defendants at Time of Indictment

Offense Category	Sample Size	Percent Jail	Percent Bond	Percent Non-Arrest
1	25	56.0	24.0	20.0
2	60	50.0	35.0	15.0
3	48	75.0	4.2	20.8
4	58	27.6	63.8	8.6
5	33	27.3	57.6	15.1
6	40	27.5	42.5	30.0
7	25	52.0	40.0	8.0
9	47	23.4	70.2	6.4
10	26	57.7	30.8	11.5
11	26	19.2	50.0	30.8

By looking at the number of scheduled trial dates, the continuance rate by offense and jail-bond status can be determined. In conducting this analysis, one must be careful not to record a bond forfiture as a continuance. These data are used in the disposition stage of the model and are presented in Table 3.

Further information used in the disposition stage is the bond forfiture rate by type of offense. These data are presented in Table 4.

As discussed earlier, it is not uncommon to have more than one defendant on one indictment. The generation stage handles this and the case file data supply the necessary statistics. These data are found in Table 5.

Case file data also point out that certain types of cases take longer than others to reach their first trial date. These cases primarily involve capital offenses where the defendant is in jail. This fact was not realized until the validation stage of the thesis; however, relevant statistics are presented in Table 6.

The data necessary to create the proper waiting time functions for bond forfitures and non-arrests are also gathered from the case files. As mentioned earlier, there is a high and low rate for both bond forfitures and non-arrests. The continuous functions presented in Figure 2 are used by the disposition stage of the model to determine these times.

Calendar Data

The third major source of information other than the docket and the case files is copies of the calendars used during 1970 and 1971. The calendar has the following information on it:

Table 3. Continuance Rates

Offense Category	Jail-Bond Status	Sample Size	Percentage of Defendants Continued					
			0 Times	1 Time	2 Times	3 Times	4 Times	5 or More Times
1	J	18	55.6	44.4	27.8	5.6	5.6	0
	B	6	16.7	83.3	50.0	0	0	0
2	J	32	71.9	28.1	6.2	3.1	3.1	0
	B	25	60.0	40.0	12.0	4.0	0	0
3	J	42	61.9	38.1	14.3	9.5	7.1	0
	B	3	33.3	66.7	33.3	0	0	0
4	J	17	52.9	47.1	17.5	5.9	5.9	5.9
	B	36	69.4	30.6	13.9	5.6	5.6	2.8
5	J	9	88.9	11.1	11.1	11.1	0	0
	B	16	68.8	31.2	18.8	12.5	12.5	1.0
6	J	14	100.0	0	0	0	0	0
	B	20	45.0	55.0	35.0	20.0	20.0	5.0
7	J	13	53.8	46.2	15.4	0	0	0
	B	9	66.7	33.3	22.2	0	0	0
9	J	11	72.7	27.3	18.2	0	0	0
	B	32	59.4	40.6	18.8	3.1	3.1	3.1
10	J	15	66.7	33.3	13.3	6.7	6.7	6.7
	B	10	20.0	80.0	30.0	10.0	0	0
11	J	8	87.5	12.5	12.5	0	0	0
	B	14	71.4	28.6	21.4	14.3	14.3	0
TOTALS	J	179	68.2	31.8	13.4	5.0	3.9	1.1
	B	170	57.6	42.4	21.0	7.6	6.5	1.8

Table 4. Bond Forfiture Data

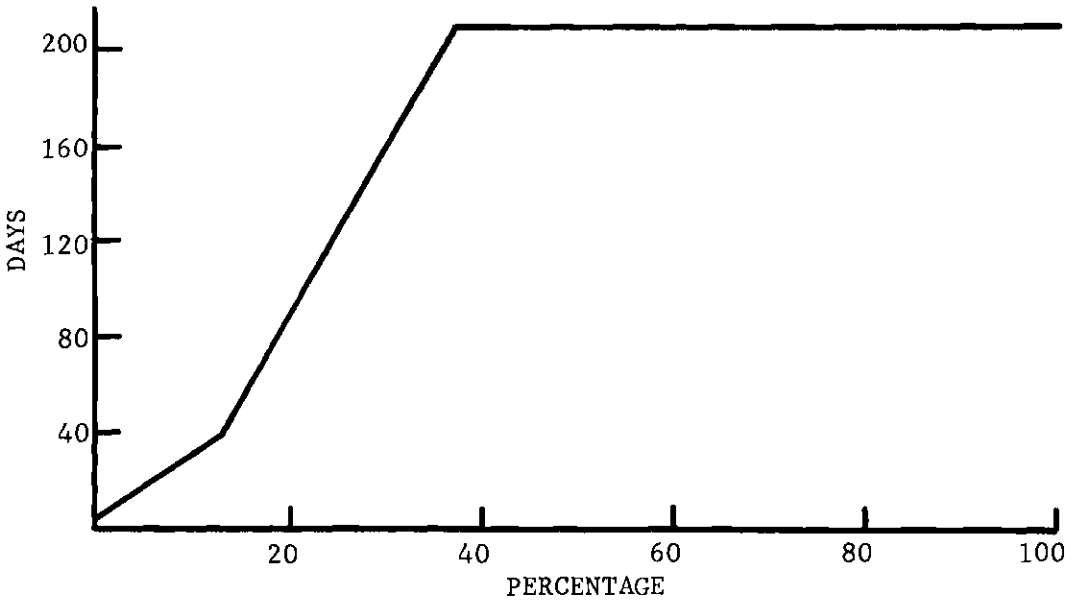
Offense Category	Number of Bond Defendants Sampled	Number of Bond Forfitures	Percentage of Bond Forfitures
1	8	0	0
2	21	2	9.5
3	3	0	0
4	37	5	13.5
5	19	5	26.3
6	20	4	20.0
7	10	1	10.0
9	33	9	27.3
10	12	2	16.7
11	15	0	0

Table 5. Multi-Defendant Indictments

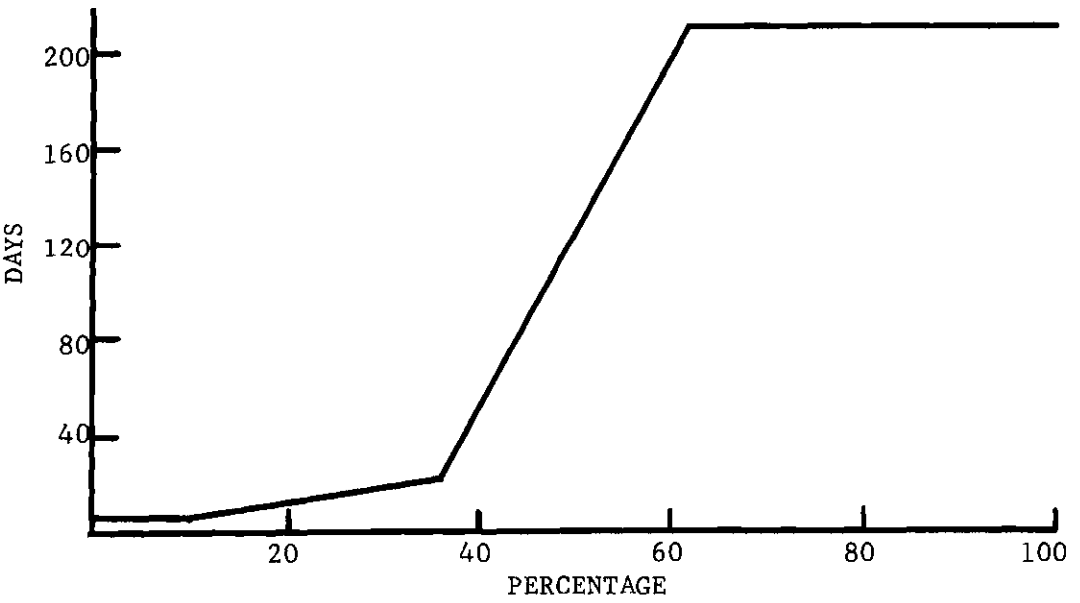
Offense Category	Sample Size	Cumulative Percentage of Defendants per Indictment				
		1 Def	2 Def	3 Def	4 Def	5 Def
1	25	96.0		100.0		
2	39	74.4	79.5	97.4		100.0
3	31	58.1	90.3	93.5		100.0
4	53	96.4	98.2	100.0		
5	29	89.6	96.5	100.0		
6	34	76.5	91.2	97.0	100.0	
7	22	95.4		100.0		
9	40	87.5	95.0	100.0		
10	22	81.8	95.4		100.0	
11	22	86.4	95.5	100.0		

Table 6. Defendant Delay Data

Offense Category	Percent Jail Def Delayed 5 Days	Percent Jail Def Delayed 14 Days
1	36.0	64.0
3	51.2	48.8
7	49.0	51.0
10	95.0	5.0

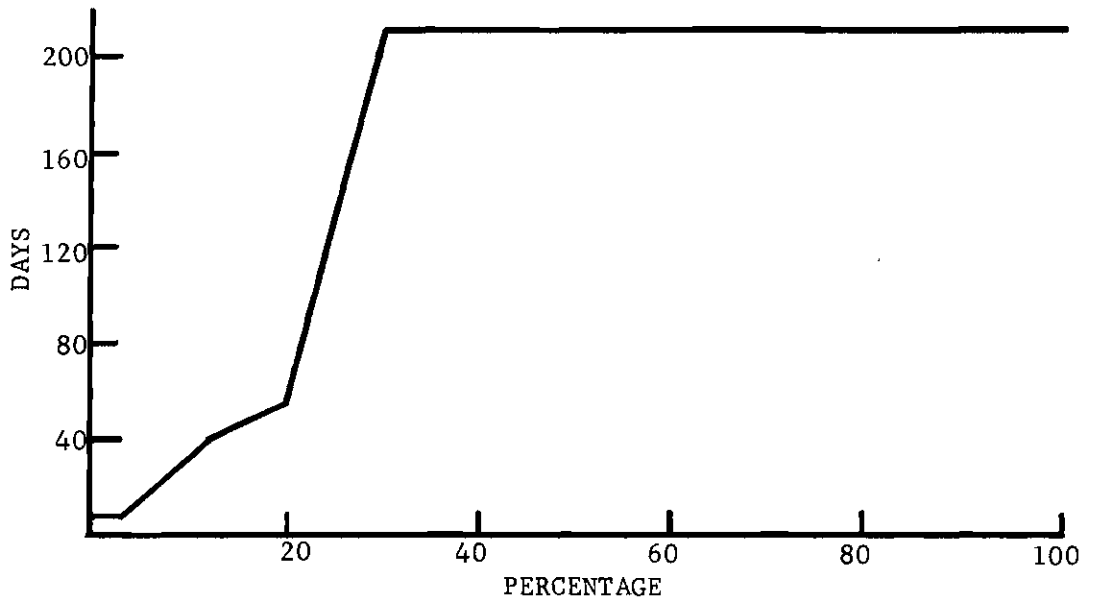


a. Low Rearrest Rate for Bond Forfitures

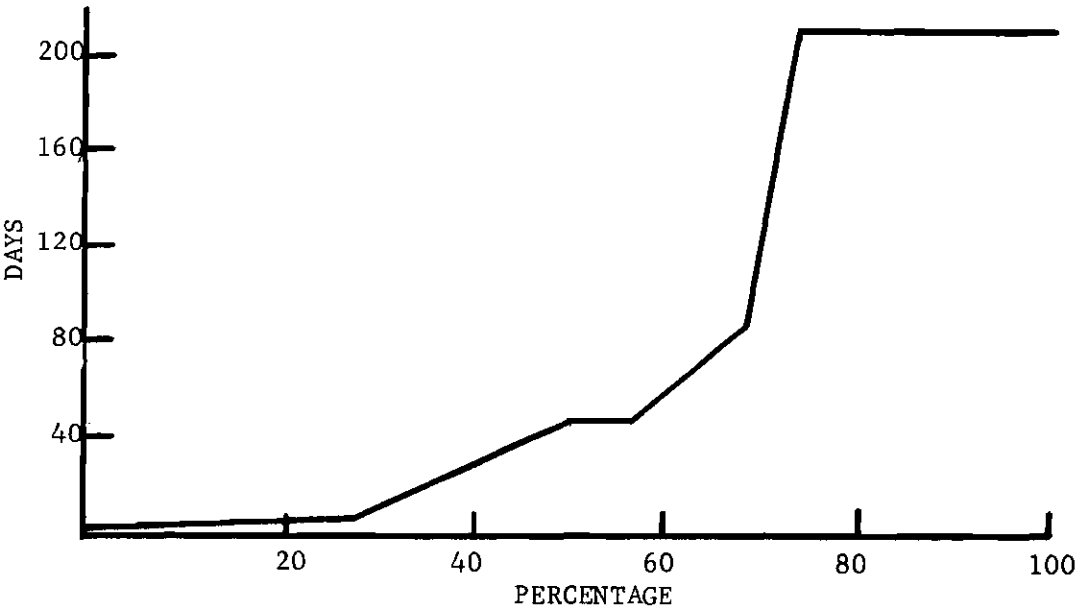


b. High Rearrest Rate for Bond Forfitures

Figure 2



c. Low Arrest Rate for Non-arrests



d. High Arrest Rate for Non-arrests

Figure 2. Concluded

1. Defendant's name
2. All offenses for which the defendant is charged
3. Case numbers of all offenses
4. Judge who will hear the case
5. Assistant District Attorney who will preside over the case
6. Defense attorney
7. Date case will be tried
8. Date calendar was approved.

The only item of information that is sometimes missing is the name of the defense attorney.

One of the reasons for recording data from old calendars was to determine the average number of defendants scheduled each day court was held. These calendar data enable the scheduling stage of the model to prepare the model's schedules at approximately the same time of the year the C.C.C. prepared them. Table 7 provides the approximate day the calendars were prepared and the total number of defendants placed on them. Specifically, these data are used to prepare Function 60. The daily information is not presented formally; however, the interested reader can obtain this information by interpreting Functions 61 through 68 in the Appendix.

Not only is it necessary to know how many defendants to schedule, but the model must also know what types of transactions to schedule. The last column of Table 7 provides this information.

Table 7. Calendar Data

Date Preparation	Number of Def Scheduled	Type of Calendar
1-21-70	306	Normal only
2-02-70	164	Normal only
2-13-70	238	Normal only
2-27-70	264	Normal only
3-12-70	330	Normal only
3-30-70	280	Normal only
4-16-70	244	Normal only
5-01-70	252	Normal only
5-18-70	320	Normal plus Plea Bond
6-03-70	348	Normal only
7-10-70	24	Jail Plea only
7-14-70	280	Normal only
7-22-70	13	Jail Plea only
8-18-70	280	Normal only
8-19-70	28	Jail Plea only
9-04-70	144	Normal only
9-08-70	174	Plea and Reg Bond only
9-22-70	288	Normal plus Reg Bond
9-23-70	11	Jail Plea only
10-07-70	160	Normal only
10-14-70	220	Normal only
10-22-70	160	Normal plus Plea Bond
10-26-70	126	Normal plus Plea Bond
10-28-70	12	Jail Plea only
11-04-70	176	Normal plus Plea Bond
11-09-70	134	Normal only
11-17-70	176	Normal plus Plea Bond
11-24-70	172	Normal plus Reg Bond
12-03-70	184	Normal plus Reg Bond
12-14-70	192	Normal only
12-30-70	368	Normal plus Plea Bond
1-12-71	192	Normal only
1-20-71	184	Normal plus Plea Bond
1-28-71	184	Normal plus Plea Bond
2-03-71	184	Normal plus Plea and Reg Bond
2-15-71	384	Normal only

Additional Data Sources

In addition to the information already obtained, there was a need for other data not easily available in the three sources previously discussed. For example, it was necessary to obtain more information about the multi-indictment defendant. The model needed information on how many transactions must be removed and from which generation systems to remove them in order to insure that the proper number of different transactions was placed in the system. The source for this information was a book found in the C.C.C.'s office containing the alphabetical listing of all felony defendants. Starting with the A's, every tenth different defendant was examined to determine all of the offenses he had been charged with. Using this information, a check was made of the docket to find out which indictments were disposed of on the same day. When a defendant had more than one offense disposed of on the same day, he was assumed to be a multi-indictment defendant. This information provided the percentage of multi-indictment defendants by offense category; however, this did not solve the whole problem. A decision rule had to be derived for handling multi-indictment defendants who were charged with more than one type of offense. For example, if a defendant is indicted for rape, aggravated assault, robbery, and a misdemeanor, the model must create only one transaction to represent this defendant. The decision rule which accomplished this was one which terminated transactions representing all but the most serious offense. The following is a list of the various offenses, with the lower numbered offenses being the most serious:

1. Murder
2. Rape
3. Armed robbery
4. Kidnapping
5. Sodomy
6. Burglary
7. Robbery
8. Child molestation
9. Larceny
10. Aggravated assault
11. Narcotics offense
12. Motor vehicle theft
13. Forgery
14. Credit card theft
15. Other felonies
16. Misdemeanors

The reason there are more than eleven categories in this list is because the case files sampled list the exact nature of the offense and this added detail is used. Thus, in the example mentioned earlier, the transaction representing the rape would remain in the system, while the transactions representing the other offenses would be terminated.

Finally, this decision rule points out why the generation stage does not create any transactions representing misdemeanor indictments. Since the Superior Court does not handle defendants charged only with misdemeanors and by virtue of the fact that the decision rule designates a

misdemeanor as the least serious offense, there is virtually no need to have misdemeanor transactions generated. The percentage of the transactions to be eliminated from each of the remaining 10 generation systems is presented in Table 8.

Table 8. Multi-Indictment Defendant Data

Offense Category	Sample Size	Number of Multi-Indictment Defendants	Percentage of Def To Be Eliminated
1	32	1	4.3
2	141	10	7.1
3	71	7	9.8
4	78	14	17.9
5	53	8	15.1
6	81	15	18.5
7	13	1	7.7
9	98	12	12.2
10	70	11	15.7
11	107	28	26.2

One final source was needed because of the method of disposing of jail and bond plea cases. Since the transactions are disposed of regardless of the type of offense, other records were needed to provide the continuance rate. On file in the C.C.C.'s office are records indicating the total number of cases disposed of each day by every judge who presided over a felony court. This information is not broken down by offense or defendants, but rather by the number of cases scheduled and the manner in which each was disposed of. To find out the continuance rate for plea

cases, one has only to find the day when plea cases were scheduled and look at the daily continuance rate. This process was done and the average continuance rate for plea bond cases was 39 percent, while the continuance rate for jail plea cases was only 20 percent.

The information and data presented in this chapter are by no means all that are available from these sources. What was presented was the information necessary to make the model function properly. Future researchers will surely use the same sources for many other statistics.

CHAPTER V

MODEL VALIDATION

General

Once the model was created and the sample data gathered, the final procedure prior to examining the various alternatives was to validate the model. This procedure was more difficult because of the complexity of the real world system and the amount of time needed to gather good data. Ideally, the sample data used to help create the model should not have been used for validation, instead data from another time period or different data from the same period should have been used. If time had been available, this method of validation would have been used and, should further research be done in this area, future data could be used.

Even though new data were not available, it is felt that, because of the design of the model, the available sample data will be useful. The reason for this belief lies in the fact that the time it takes a transaction to get through the system is based to a large extent, not on sample data, but rather on the model's performance of functions in the same manner as they occur in the real world. For example, the amount of time it takes a transaction to be scheduled for trial is not based on averages but on the scheduling queue discipline. The time the transaction spends waiting for the trial date does not depend on sample average times, but on the actual number of days between scheduling and trial date.

Stage I

Bearing in mind the disadvantages of using old sample data, validation efforts were made. Basically, this procedure was accomplished in two stages. The first stage involved attempts to validate the mean time through the system for each type of offense and jail-bond status. While this procedure only checked one parameter, it was an easy method for detecting gross errors in the model. As a result of this stage, several errors were detected. While none of the errors could be considered gross, they did point out aspects of the real world system which had not been planned for in the model.

The first error detected stemmed from the fact that, once the C.C.C. starts to prepare the calendar, it takes him approximately three to four days. After the preparation starts, the C.C.C. does not normally consider any new active cases, with the exception of a few of the oldest continued cases. In the model, the calendar took only a few seconds to prepare. All new cases or continued cases were allowed to enter the scheduling queue up to just before the scheduling actually took place. Compounding this problem was the fact that the model assumed that the calendar was prepared on a Saturday, thus insuring that every new case or continued case for that week was considered. The effect of these errors was to cause the model to dispose of transactions more rapidly than the real world. This error was eliminated by preparing the model calendar on Thursday and adding a three-day delay to any continued transaction prior to its reentry into the scheduling queue.

Another error detected using this parameter procedure was one concerning murder, armed robbery, and rape transactions which were in jail.

For some reason, the model was processing these cases more rapidly than the real world. After reexamination of the sample data, it was found that, for many of the capital offenses, there was a longer than normal delay prior to the first trial date. The detailed data on these delays are presented in Chapter IV. It is assumed that the reason for delay lies in the fact that capital cases require more time to prepare, both by the District Attorney and the defense attorney. As a consequence of this fact, the C.C.C. delays the scheduling accordingly. To take this fact into consideration, time delays were added by the use of Blocks 710 and 711.

Finally, one further error was detected concerning the lesser offense categories. The model was disposing of these offenses, primarily larceny, forgery, and narcotics, too rapidly. Because other types of offenses are more serious, their defendants are scheduled in the first part of the week, for the reasons discussed earlier. While this feature does not affect which transactions will be scheduled, it does affect the day of the week on which they are tried. For that reason, lesser offense defendants should take on the average slightly longer than the more serious offenses. Because of the nature of GPSS II, this situation could not be solved easily by the use of priorities; therefore, a spurious time delay was built in for lesser offense transactions using Block 712.

Following the detection of the third error, the model was run three times using three different random number seeds. The purpose of using three different seeds, or starting random numbers, was to cause the computer to feed a different sequence of random numbers into the model.

Since the model uses many random numbers, this action served to create slightly different results using the exact same computer program. The average of these runs using different seeds provides the researcher with a truer picture of the model's results. The average of these three runs was used in validation. Results of this final attempt at parametric verification are presented in Table 9.

Stage II

The final stage of validation used a more conventional approach, the comparison of the sample data cumulative frequency distribution with the hypothesized or model cumulative frequency distribution. The procedure chosen to make this comparison was the Kolmolgorov-Smirnov Test. Since a discussion of this test along with examples can be found in almost any textbook on simulation,[16] a detailed effort to explain the test will not be presented here.

The purpose of the Kolmolgorov-Smirnov test is to determine the degree of agreement between these two distributions, one compares the maximum deviation between the two against a certain statistical limit. This limit is based on the significance level chosen and the size of the sample. Once these two variables have been chosen, one would use the following formula to determine the limit:

$$L = \frac{A}{\sqrt{N}} \quad \text{where N is the sample size.}$$

The value A is taken from a table of critical values for the K-S test and is based on the significance level and sample size.[17]

Table 9. Parametric Validation

Offense and Jail-Bond Status	Days				
	1st Run Results	2nd Run Results	3rd Run Results	Model Average	Sample Time
1 B	132.0	121.0	125.6	126.2	128.4
2 B	87.0	87.9	79.0	84.6	95.5
3 B	57.0	68.8	52.7	59.5	70.6
4 B	90.9	93.7	86.7	90.4	103.6
5 B	82.7	84.6	73.0	80.1	91.4
6 B	97.1	103.7	95.7	98.8	106.1
7 B	84.6	89.8	87.9	87.4	82.8
9 B	90.7	88.5	87.8	89.0	102.6
10 B	112.3	111.4	102.5	108.7	109.0
11 B	81.5	85.5	77.0	81.3	86.2
1 J	59.3	62.2	57.6	59.7	57.2
2 J	38.4	39.7	38.4	38.8	40.8
3 J	52.6	53.2	52.0	52.6	50.5
4 J	50.7	48.3	50.0	49.7	50.6
5 J	31.3	33.4	30.2	31.6	35.6
6 J	31.1	32.1	30.9	31.4	28.5
7 J	57.2	54.0	50.6	53.9	57.0
9 J	38.2	38.0	37.2	37.8	34.8
10 J	45.3	45.3	45.7	45.5	44.5
11 J	34.0	36.4	34.0	34.8	37.8

In this situation, a significance level of .05 was chosen and the sample size was 282. The limit in this case would be .0795. Thus, if every deviation between the two distributions is less than .0795, the hypothesis that the sample distribution and the model distribution are the same cannot be rejected. Table 10 displays the vital information concerning these two distributions. The cumulative distribution function based on sample data is a compilation of every sampled defendant's time in the system from indictment to initial disposition. This is information previously taken from the case files. The hypothesized cumulative frequency distribution is based on model data and is found in Table 21 of the computer print out. In actuality, this table is a combination of the preceding tables, 1 through 20. Observing that the maximum deviation is less than the limit, the hypothesis that the two distributions are the same cannot be rejected. Therefore, it is assumed that the model is validated.

Table 10. Kolmolgorov-Smirnov Test Results

Time Interval (Days)	Observed Sample Data			Model Cumulative Distribution Function	Deviation
	Frequency	Cumulative Frequency	Cumulative Distribution Function		
0-30	69	69	.245	.201	.044
31-60	79	148	.525	.543	.018
61-90	67	215	.762	.762	.000
91-120	33	248	.879	.886	.007
121-150	15	263	.933	.949	.016
151-180	10	273	.968	.981	.013
181-210	4	277	.982	.995	.013
211-240	3	280	.993	.9997	.007
241-∞	2	282	1.000	1.000	.000

CHAPTER VI

MODEL MODIFICATIONS

Objective

Once the model has been validated, the usefulness of it has just begun. While the descriptive knowledge gained from building the model is important, the unique value of the model stems from the researcher's ability to modify it. By experimenting and trying various alternatives, one can get an indication of which proposals offer the most promising results. Using this information, the researcher can then present a series of alternatives to the decision maker with a description of their most likely results.

The objective of this thesis is to recommend various alternatives for reducing the time a defendant spends in the criminal justice system between Grand Jury indictment and the initial disposition of his case. Even though the overall goal was time reduction, a certain time standard was sought as a more concrete objective. The decision was made to use the time standard developed by the President's Commission on Law Enforcement and Administration of Justice.[18] Due to the nature of the court this standard was developed for, it cannot be applied directly to the Fulton County Superior Court. Modifying the standard somewhat, it became the goal of this thesis to reduce the maximum time from indictment to initial disposition to 90 days, or approximately three months. This goal meant

that every defendant, regardless of offense, jail-bond status, date of indictment, or number of continuances, should be initially disposed of within 90 days after the Grand Jury returns his indictment as a true bill.

Pre-Modification Conditions

Prior to investigating various modifications, one must first establish a frame of reference from which to judge their results. The frame of reference for this model was the three different computer runs used in validation. Combining the information from these three runs, it took the average transaction 66.5 days to go from Grand Jury indictment to initial disposition. During that same period, 23.7 percent of the transactions took longer than 90 days.

One More Judge

The first modification involved the adding of one additional judge to every week court was held during the simulated time period. This modification was examined first, because it is the solution offered most frequently by the public.

Since it was already known how many defendants were on a judge's calendar for a particular day of the year, it was a relatively simple matter to add one more judge. The procedure involved modifying Functions 60 through 68 to enable the scheduling stage to add more transactions each time the calendar was prepared. The effect of this modification was to reduce the average defendant's time in the system to 52.5 days and reduce the percentage over 90 days to 12.5 percent.

This addition of one more judge would result in a sizeable reduction

in both categories; however, it was the hope of this author to find other equally effective alternatives. This search was motivated by the fact that judges are scarce resources. In other words, judges placed in the Criminal Jury Division cannot serve in any of the other divisions of the court where they are also needed. Therefore, it was felt that other alternatives not requiring additional judges would be preferable.

Plea Calendar

Bearing the above discussion in mind, the next alternative was one concerning the plea calendar. As discussed earlier, the plea calendar concept was not used during the whole year of 1970 except on a semi-regular basis. The objective of this modification was to schedule a certain number of plea defendants every week court was held. It was planned that one judge would hear up to a maximum of 20 plea bond defendants every Thursday.

To apply this modification, Functions 60 through 68 were changed to leave one judge with no regularly scheduled defendants on Thursday. These functions were also modified to eliminate the irregular usage of the plea calendar during 1970. Finally, Functions 70 and 72 were modified to insure that 20 plea bond transactions were scheduled each Thursday. This modification reduced the average time to 64.4 days with only 22.3 percent of the transactions taking longer than 90 days. While this reduc- was not as great as with the addition of one more judge, it would not require any additional resources.

Partial Vacation Elimination

Following the use of the plea calendar, it was decided to investigate the possibility of eliminating part of the summer vacation. The reader will recall that, during the July-August term of 1970, regular court was held only for two weeks. Also, during those two weeks, the number of defendants scheduled was 15 to 20 percent below average. The objective of this modification was to schedule six weeks of court but still at the reduced work load.

As before, this modification was accomplished by changing Functions 60 through 68, enabling the model to schedule four additional weeks of court. The effect of this modification, coupled with the plea calendar modification, was to further reduce the average time to 51.3 days and reduce the over 90 percentage to 9.1 percent.

Continuance Rate

While the reduction achieved by the last two modifications was significant, it was hoped that further reduction could be made by reducing the number of continuances. This question of very liberal continuance policies has been raised in the criticism of the court, and the sample data do tend to substantiate it. The problem involved with applying this modification was complicated by the fact that this was a legal problem as well as a management problem. One gets into a controversial area when one attempts to possibly take away some of the rights of the accused. With this in mind, it was decided to modify the continuance rates only for those defendants whose cases had been continued two previous times. It is felt that, by the third time a case appears, most truly legitimate

reasons for continuances have been exhausted. At this point the judge should exercise his authority and make every effort to dispose of the case.

To accomplish this effect, the model was changed so that only two percent of the transactions, regardless of offense, would be continued a third time. Should the transaction be continued at this time, only one percent would be continued during any subsequent trial dates. This investigation was accomplished by changing Functions 75 through 94 to reflect those percentages. Results of this investigation, coupled with the previous two, were somewhat unexpected. During this one run, the average time increased slightly from 51.3 to 51.7 days and the percentage over 90 days increased from 9.1 to 9.9 percent.

There are several factors which could possibly cause these unexpected results. One of these factors deals with the particular sequence chosen to apply the modifications to the validated model. After the first change is made on the model, subsequent modifications interact not only with the model but also with previous changes.

While it would be desirable to know the relative effectiveness of each modification, that is not the primary goal of the research. The primary goal is to determine those modifications whose cumulative effect reduces the percentage of defendants taking longer than 90 days to be processed by the system. The sequence in which the modifications were applied, will not influence these cumulative results. Therefore, while it is desirable to know more precisely the relative effect of each change, it is not essential.

Should knowledge of a more exact nature concerning relative effectiveness be desired, it could be determined by future research. This information could be obtained by trying all possible sequences on the validated model; however, as will be pointed out a little later, this procedure would require a considerable amount of computer run time.

In addition to the sequence factor, the very design of the model could cause these unexpected results. As discussed earlier in Chapter V, it is possible to cause the exact same computer model to print out slightly different results by changing the sequence of random numbers used by the model. Earlier the sequence was altered by changing the random number seed; however, the sequence is also automatically altered by adding modifications to the model. Thus, the unexpected results could have been caused by the change in the sequence of random numbers. To obtain a truer picture of the modification's results, one should run the model with each modification several times. It would be desirable to run each modification three times; however, the resulting computer costs would be unacceptable for academic purposes. Depending on the modifications, the model takes between four to seven minutes to run. Therefore, to run all modifications three times, one would need between an hour and a half to two hours of additional computer time.

Even though the average result of the continuance modification would possibly result in a time reduction, the one run does point out that this change does not appear to have an appreciable effect. Further investigation revealed an explanation for this occurrence. Presently, in the real world system, only a small percentage of defendants is continued

three or more times. To make a continuance modification more effective, one must alter not only the continuance rate at the third level, but also at the first and second levels. Of course, this makes the legal question even more thorny. For that reason, further research in this area was terminated, but it remains open for future studies.

Monday Calendar Preparation

The next modification to be applied was one concerning the day on which the calendar is prepared. As discussed earlier, the calendar is normally prepared at least two weeks prior to the first trial date on that calendar. To accomplish this timing, the C.C.C. starts preparing the calendar almost three weeks in advance. The effect of starting this early is to prematurely eliminate cases continued during that extra week. Since the continued cases are the ones which create the times over the 90 day mark, it is felt that every effort should be made to reschedule them as early as possible.

According to the C.C.C., he can prepare a calendar in one day if he is not faced with continual interruptions, which normally make the time extend to three or four days. It is the purpose of this modification to examine the possibility of preparing the calendar on the Monday preceding the first trial date by exactly two weeks. The effect of this modification is to insure that all transactions are available for scheduling and rescheduling.

This change was accomplished by modifying the X field in Block 450 to 15 and eliminating the time delay following the disposition of all continued cases. This latter change was done by eliminating the waiting

time in Block 353. The effect of this modification was to reduce the average time to 49.8 days and the percentage over 90 days to 8.0 percent.

First In First Out

Even though the four previous modifications would have the cumulative effect of significantly reducing both the average time and the percentage of transactions over 90 days, it was decided to continue the research. From an analysis of Tables 1 through 10 in the model, it became obvious that the bond cases constituted the vast majority of those transactions taking longer than 90 days to reach disposition. While one of the reasons stems from the fact that bond cases normally have higher continuance rates, it was felt that the main reason was the scheduling priority. As discussed earlier, the overcrowding conditions at the Fulton County Jail require that all defendants in jail be scheduled before any defendants out on bond. It was the opinion of this author that, by using a priority of first in first out (FIFO), the percentage over 90 days might be reduced. It was also theorized that there would be little change in the average time through the system.

To change the model to try this alternative, it was a simple matter to increase all the initial bond priorities to equal those of the jail transactions. This procedure would enable the scheduling stage to initially schedule all transactions on a FIFO basis, while still scheduling on a higher priority the continued transactions. This actual modification involved having all bond transactions go through the 13 block of the generation stage, which was previously used just for jail transactions. The result of this modification was to reduce the average time to 49.0

days and to reduce the percentage of defendants over 90 days to 6.0 percent.

Selective Judge Addition

During this last series of modifications, no new judge resources had been added other than to require the assigned judges to work more in the July-August term. However, at this point it was felt that the only other alternative that could be applied, without attempting to drastically revise the real world procedure, was to selectively add more judges. In determining when to add these judges, it was necessary to find out when the largest backlogs occurred in the system.

By using the data printed out prior to the preparation of each calendar, one could determine that point in time when the scheduling queue was the longest. That point, as might be expected, occurred immediately following the summer vacation. Even though the vacation had been partially eliminated by an earlier modification, the effect of the vacation still appeared to be the most significant factor in producing a backlog. Thus, it was decided to try adding one additional judge to the Criminal Jury Division during each of the first three weeks court was held in the September-October term.

This modification was accomplished by again changing Functions 60 through 68 in the model. The effect of adding these three judges at this time reduced the average time to 48.2 days; however, the model indicated that this alternative had no effect on the over 90 days percentage. As in the continuance modification discussed earlier, the reason for this unexpected result could be caused by either the modification sequence or the

lack of replication. However, this result did point out that this modification did not appear to be highly effective.

Prior to trying other alternatives, it was decided to eliminate those two modifications which would be the most difficult to implement in the real world. Thus, the continuance modification and the FIFO modification were eliminated, leaving the previous sequence with the following modifications: plea calendar, partial vacation elimination, Monday calendar preparation, and selective judge addition. Since neither of the eliminated alternatives appeared to be very effective in time reduction, it was suspected that their removal would not greatly increase the times obtained from the last model run. To verify this suspicion, the model was run again. The results after elimination showed a slight increase in average time to 50.4 days and an increase in the percentage of transactions over 90 days to 8.0 percent.

Initialization

At this point in the modification stage, there were approximately eight percent of all transactions still taking longer than 90 days to get through the system. There were several alternatives open to the researcher. One possibility was to try various other schemes for adding even more judges at other points in time. Investigating this possibility revealed another alternative. Observing the number of defendants available for scheduling in the latter stages of 1970 and the early part of 1971 revealed that the queue size was quite small compared to the first nine months of 1970. There were even times when the model called for more transactions to be scheduled than there were in the scheduling queue. The reason for

this rather unexpected occurrence became known after a more detailed analysis of the system and the modifications affecting it.

The real world system reacted to the excessive backlog following the summer vacation by using four judges every week and giving each judge up to 15 defendants Monday through Wednesday and 10 on Thursday. Even with this added emphasis, this backlog of over 1,000 cases at the beginning of September would not reach a more manageable figure, consistently below 500, until late in the March-April term of 1971. Thus, the real world was still coping with the summer backlog until the spring of the next year. This observation also pointed out why the model had such small queues starting in December of 1970. The model was still programmed, based on real world data, to fight a backlog problem which it had partially been able to solve as a result of the earlier modifications by November of 1970. This finding in itself was a very important real world revelation. How to use this additional information to examine the model proposed a problem.

It was assumed that the initialization data fed into the model at the beginning of 1970 were also based to a large extent on the backlog created by the summer vacation of 1969. In other words, up to this point, the effectiveness of the modifications on the model were distorted by figures beyond the model's control. Thus, to get an accurate picture of the effect of the modifications, one must use different initialization conditions. This fact was particularly important since the objective of one of the modifications was to reduce the effect of the vacation.

Therefore, it was decided to use model data taken from 1971 to initialize the system. As a result of this decision, the scheduling queue

was initialized to have 272 transactions in it rather than the 600 previously used. This change involved modifying Blocks 205 and 210 to feed in a lesser amount of the 1969 cases. The effect of this modification, coupled with the four previous modifications, was to reduce the average time to 45.5 days and the percentage of transactions over 90 days to 4.1 percent.

Complete Vacation Elimination

After the realization of the immense effect of the summer vacation, it was decided to try one more modification. This final modification involved eliminating the entire summer vacation, while at the same time scheduling a normal work load of 12 defendants Monday through Wednesday and eight on Thursday. The change was initially applied to the model without using any other modification.

Specifically, the model was altered by changing Functions 60 through 68 in the same manner discussed earlier in the partial vacation elimination. The result of this alternative alone was to reduce the average time from 66.5 days to 49.7 days and to reduce the percentage over 90 days from 23.7 percent to 7.9 percent.

When the Monday calendar, plea calendar, and initialization modifications were added, there was an even greater reduction. The cumulative effect was to reduce the average time to 43.8 days and the percentage over 90 days to 3.2 percent.

Summary

Table 11 displays all of the model modifications and the effect each had on the average time through the system and the percentage of

transactions over 90 days. Even though the researcher stopped prior to getting the over 90 day percentage to zero, it is felt that this could be attained by selectively adding judges. Should zero percent become a real world goal, it would be an easy matter to use 20 to 30 minutes of computer time to find the proper combination.

Table 11. Summary of Model Results

Run Number	Model Characteristics	Average Time (Days)	Percentage Over 90 Days
1	First Validation Run	68.2	25.1
2	Second Validation Run	67.4	24.7
3	Third Validation Run	63.9	21.4
	Validation Average	66.5	23.7
4	One More Judge	52.5	12.5
5	Plea Calendar	64.6	22.3
6	Partial Vacation Elimination plus 5	51.3	9.1
7	Continuance Rate plus 5 and 6	51.7	9.9
8	Monday Calendar Prep plus 5, 6, and 7	49.8	8.0
9	First In, First Out plus 5, 6, 7, and 8	49.0	6.0
10	Selective Judge Add plus 5, 6, 7, 8, and 9	48.2	6.0
11	Modifications 5, 6, 8, and 10	50.4	8.0
12	Initialization plus 5, 6, 8, and 10	45.5	4.1
13	Complete Vacation Elimination Only	49.7	7.9
14	Complete Summer Vacation Elimination, Plea Calendar, Monday Calendar Prep, and Initialization Modifications	43.8	3.2

In concluding the discussion about the modifications, two other items deserve some mention. While seeking alternatives to reduce the average transaction's time in the system, those few cases which take an

abnormal amount of time were also being affected. These are the types of cases which normally receive the adverse publicity. In the validated model without modifications, it took the model 265 days to process the longest case. As a result of almost every modification, the longest transaction's time was reduced. In the final modification, the maximum time had been reduced to 160 days. This additional benefit derived from the modifications should serve to reduce the so-called exposé stories of court delay.

The final item that should be mentioned concerning these modifications is that they have not been validated. The basic model was verified within certain limits, but once the changes were made the researcher was no longer working with a strictly validated model. It is hoped that the results indicated by the model will work the same way in the real world, but there is no hard and fast way to prove it. This problem is by no means unique, in fact in all forms of analysis, it is difficult to precisely predict the effect of the recommendations. Basically, this is one of the reasons for using a simulation approach, while it cannot predict exactly the effect of future modifications, it is one of the better predictive techniques.

CHAPTER VII

CONCLUSIONS

General

Prior to discussing the time delays found in the Criminal Jury Division of the Superior Court of Fulton County, an overall comment will help put all of the results into perspective. In the past, felony defendants in Fulton County have had lesser time delays than the majority of their counterparts in other large urban areas. Compared with the rest of the State of Georgia, the present system of processing a defendant from the time of indictment to the time of initial disposition is orderly and efficient. However, as the volume of felony defendants increases, certain changes will have to be made. Many of the changes discussed later are presently being used more and more by this court; however, there must be a continuing search for even better techniques.

Reasons for Delay

In analyzing the sample data and the computer model, several factors were identified which appeared to cause felony defendants delay in processing their cases. Since the time period under investigation was only 14 months, one cannot definitely say these same factors were influential prior to or after the simulated time period. However, it is the belief of this author that all the factors, to a greater or lesser degree, would have an effect on past defendants and will have a greater effect on

future defendants if not corrected.

The most significant factor causing defendant delay was the summer vacation in the July-August term of 1970. The effect of this vacation was to create a backlog so large as to significantly influence the scheduling until the end of April, 1971.

A second factor causing delay is the priority given to bond cases. The effect of this priority is to force bond defendants to spend approximately twice as long in the system as their jail counterparts. Of course, this same priority insures that jail defendants experience very little delay.

Finally, it could be pointed out that delay could be attributed to an insufficient number of judges in the Criminal Jury Division. However, one must remember judges are scarce resources and those assigned to this Division normally must be taken from another.

Possible Solutions

As pointed out in the body of the paper, by partially or completely eliminating the summer vacation, major strides can be made towards eliminating defendant delay. It was demonstrated by the model that this solution offers the best possibility of those modifications investigated for significantly reducing future defendant backlogs.

The problem involving bond defendants can be reduced somewhat by greater usage of the plea calendar. While this action does not affect every bond defendant directly, it does serve to reduce the total backlog.

Finally, the time delay can be reduced by adding more judges. There were times, especially when there were only three assigned judges,

when the addition of one more judge could have aided in reducing defendant delay. This solution should be the final choice because of the reasons discussed earlier; however, it could be used in a flexible manner to eliminate periodic backlogs.

CHAPTER VIII

RECOMMENDATIONS

General

The possibilities for future quantitative research in the area of the courts is almost limitless. Several specific areas will be mentioned here; however, there are many more limited only by the imagination of the researcher. Primarily, the recommendations presented here will be based on the results or conclusions derived from building or modifying the model discussed earlier. The recommendations will fall into one of three areas: indictment to initial disposition, arrest to final disposition, or the total system.

Indictment to Initial Disposition

Even though the model developed for this thesis represented the processing of a defendant from Grand Jury indictment to initial disposition, there are many other topics for future research in this area. One major possibility is in the area of continuances. In the model presented earlier, continuances were based on offense category and jail-bond status; however, it can be proven that there are several other significant factors. For example, the judge and the trial lawyer prosecuting the case influence the continuance rate. This particular factor can be built into the model; however, it requires the sampling of many more case files to obtain large enough sample sizes for each Judge-Assistant D.A. combination.

In addition to the Judge-Assistant D.A. factor, the following also significantly influence the continuance rate: defense attorney, number of defendants per indictment, number of indictments per defendant, and the number of defendants on a particular calendar.

This area of continuance rates also presents another subject for future research. It is the belief of this author that liberal continuance policies may cause time delays and by reducing these rates the defendant will possibly be able to move through the system more rapidly. However, prior to concluding this, one must first determine what impact this rate reduction will have. For example, if greater impetus is given to disposing of a case on a particular day, one must determine what effect this will have on the other 11 defendants on that same calendar. One might find that it is infeasible to prosecute 12 defendants in one day under the reduced rates. Thus, prior to proving that the present continuance rates cause delay, one must first show that the reduced rates do not create new delays of their own.

Another topic for future research is that of forecasting future work loads. This idea can be used not only in this phase but throughout the criminal justice system.

Since almost all the work done by the Clerk is done without the help of a computer, research could be directed to determining the best way to integrate computers into the system. Again, this topic applies not only to this phase but to all phases of defendant processing.

Research could also be done in the area of identifying the specific actions performed by each individual responsible for processing a defendant

through the system. This particular topic could lead to the formulation of another simulation model similar to the one developed in New York City and discussed earlier in Chapter I.

Finally, research into this phase of the system could investigate the many possible scheduling techniques for placing defendants on the calendar. This research could also attempt to determine the optimum number of defendants to schedule on a particular calendar.

Arrest or Final Disposition

This segment of the recommendations represents that period of time between the arrest of a felony defendant and the time his case has been completely disposed of. Initially, there are many topics for future research in the area of municipal courts. Presently the Atlanta Municipal Court is overworked and understaffed. This court processes over 20,000 defendants a year and could definitely benefit from any form of analysis which could increase the efficiency of the court. This analysis could take the form of simulation, forecasting, various scheduling procedures, work load evaluation, or many others.

One area of particular concern in this phase of the processing is the method of handling narcotics cases. Unless the defendant admits to the fact that the evidence is narcotics, the suspected drugs must be sent to the state crime laboratory for chemical analysis. Because of this procedure and the recent upsurge in the number of narcotics cases, a major bottleneck has been created. Compounding this problem is the fact that defendants charged with this type of an offense are not presented to the Grand Jury unless they are accompanied by an admission of

guilt or a laboratory report. The time to get this report has steadily risen from two to three weeks in 1969, to two to three months in 1971. While efforts have been made to solve this problem by adding laboratory technicians, it is felt that this facet of the judicial process could greatly benefit from quantitative analysis.

This phase of processing also includes that period of time in which the indictments are prepared. The present system is quite efficient as far as the D.A.'s staff work is concerned; however, difficulty does arise in getting the different police departments of Fulton County to furnish sufficient information on the initial police report to prepare an indictment. This area offers several possibilities for someone concerned with management information systems.

Further, several rather drastic changes in the current procedure could be investigated. Specifically, one could examine the possibility of D.A. screening at the municipal level, rather than waiting until the cases are bound over. Presently, this is done for murder and rape cases; however, it is felt that many other different types of cases could be disposed of more efficiently and in some cases more rapidly if an experienced member of the D.A.'s staff were available to provide the arresting officers with expert legal advice. This procedure is presently being used in Washington, D. C. with considerable success.

The final aspect of processing a felony defendant is the appellate phase. This area has been the subject of great concern lately. By using the techniques of quantitative analysis, it would be possible to determine the detailed reasons behind the increase in the number of appeals and at the same time to determine why they take so long.

Finally, this entire period from arrest to final disposition could be modeled using the same approach described earlier. This would enable a researcher to investigate all the aspects of processing a felony defendant simultaneously. Complementing this larger model could be a cost study pointing out the present costs and indicating the probable cost of future modifications.

The Total System

As mentioned in the body of the thesis, the judges who sit in the Criminal Jury Division also rotate through several other divisions of the Superior Court. An excellent topic for future research would be one of seeking the optimum mix of judges within the various divisions. This research would also reveal in more quantitative terms the trade-off factors involved with determining how many judges to place in which division.

Finally, the entire state-wide allocation of judicial resources could be analyzed. This research would necessarily be on a very large scale; however, it would provide State planners with invaluable information. Even though the final fulfillment of this particular research objective would take several years, it would be a giant step towards providing each and every citizen in the State of Georgia his constitutional rights of a fair and speedy trial.

APPENDIX

THE COMPUTER COMPILATION

LOC	NAME	X	Y	Z	SEL	NBA	N_{BB}	MEAN	MOD	REMARKS	F
	JOB	237601744675									
1	FUNCTION	C1	D8								
57	175 120	127	183	144	246	150	3_{01}	169	365	160	
421	156 484	139									
2	FUNCTION	C1	D8								
57	675 120	606	183	494	246	567	3_{01}	394	365	625	
421	731 484	650									
3	FUNCTION	C1	D8								
57	344 120	439	183	269	246	289	3_{01}	412	365	353	
421	506 484	340									
4	FUNCTION	C1	D8								
57	431 120	461	183	594	246	683	3_{01}	456	365	580	
421	594 484	539									
5	FUNCTION	C1	D8								
57	369 120	339	183	325	246	350	3_{01}	506	365	380	
421	412 484	333									
6	FUNCTION	C1	D8								
57	588 120	583	183	594	246	600	3_{01}	481	365	627	
421	725 484	706									
7	FUNCTION	C1	D8								
57	50 120	94	183	119	246	122	3_{01}	94	365	133	
421	62 484	39									
8	FUNCTION	C1	D8								
57	419 120	506	183	794	246	689	3_{01}	950	365	760	
421	694 484	978									
9	FUNCTION	C1	D8								
57	475 120	328	183	556	246	411	3_{01}	394	365	333	
421	519 484	506									
10	FUNCTION	C1	D8								
57	419 120	378	183	300	246	383	3_{01}	594	365	340	
421	175 484	289									
11	FUNCTION	RN1	D3								
.56	1 .80	2	1.0	3							
12	FUNCTION	RN1	D3								
.50	1 .85	2	1.0	3							
13	FUNCTION	RN1	D3								
.75	1 .792	2	1.0	3							
14	FUNCTION	RN1	D3								
.276	1 .914	2	1.0	3							
15	FUNCTION	RN1	D3								
.273	1 .849	2	1.0	3							
16	FUNCTION	RN1	D3								
.275	1 .700	2	1.0	3							
17	FUNCTION	RN1	D3								
.52	1 .92	2	1.0	3							
18	FUNCTION	RN1	D3								
.234	1 .936	2	1.0	3							
19	FUNCTION	RN1	D3								
.577	1 .885	2	1.0	3							
20	FUNCTION	RN1	D3								
.192	1 .692	2	1.0	3							
21	FUNCTION	RN1	D2								
.96	1 1.0	3									

```
 22  FUNCTION    RN1   D4
.744  1    .795  2     .974  3     1.0   5
 23  FUNCTION    RN1   D4
.581  1    .903  2     .935  3     1.0   5
 24  FUNCTION    RN1   D3
.900  1    .950  2     1.0   3
 25  FUNCTION    RN1   D3
.850  1    .930  2     1.0   3
 26  FUNCTION    RN1   D4
.765  1    .912  2     .97   3     1.0   4
 27  FUNCTION    RN1   L2
.954  1    1.0   3
 28  FUNCTION    RN1   D3
.810  1    .920  2     1.0   3
 29  FUNCTION    RN1   D3
.818  1    .954  2     1.0   4
 30  FUNCTION    RN1   D3
.864  1    .955  2     1.0   3
 51  FUNCTION    RN1   C5
0     5    .09   5     .36   25    .62   210   1.0   210
 52  FUNCTION    RN1   C4
0     1    .14   40    .36   210   1.0   210
 53  FUNCTION    RN1   C7
0     1    .27   7     .51   45    .57   45    .69   83    .74   210
1.0   210
 54  FUNCTION    RN1   C6
0     8    .04   8     .12   40    .20   56    .30   210   1.0   210
 60  FUNCTION    C1    D53
17    306  24    0     31    164   38    0     45    238   52    0
59    264  66    0     73    330   80    0     87    280   101   0
108   244  115   0     122   252   129   0     136   320   143   0
150   348  185   0     192   280   227   0     234   280   241   0
248   144  255   0     262   286   269   0     276   160   283   220
290   160  297   126   304   176   311   134   318   176   325   172
332   184  346   0     353   192   360   368   367   0     374   192
381   184  388   184   395   184   402   0     409   384   416   0
423   400  430   0     437   352   444   0     451   344
 61  FUNCTION    C1    D17
31    44   45    32    59    36    73    46    87    40    122   36
150   48   192   40    234   0     276   48    283   60    318   50
325   52   332   56    409   52    423   56    451   48
 62  FUNCTION    C1    D19
17    34   31    44    45    34    59    36    73    44    87    38
122   36   150   48    192   40    276   48    283   60    304   50
311   0    318   50    325   52    332   56    409   52    423   5
451   48
 63  FUNCTION    C1    D22
17    32   31    44    45    32    59    36    73    46    87    40
122   36   136   48    150   36    192   40    234   36    262   48
276   32   283   60    290   34    297   0     318   50    325   38
332   42   409   52    425   56    451   48
 64  FUNCTION    C1    D24
31    32   59    24    73    30    87    26    108   16    122   24
136   16   150   36    192   20    234   32    262   0     276   32
283   40   304   26    311   34    318   26    332   30    353   36
360   28   374   36    395   28    407   36    437   32    451   28
 65  FUNCTION    C1    D18
```

```
 17   44   31   0    45   34   59   36   73   44   87   40
 122  36   150  48   192  40   234  36   248  0    253  48
 262  0    360  52   395  0    409  52   423  56   451  48
  66  FUNCTION  C1   D19
 17   44   31   0    45   32   59   36   73   46   87   38
 108  36   122  24   150  48   192  40   234  48   248  0
 262  48   353  0    360  52   395  0    409  52   423  56
 451  48
  67  FUNCTION  C1   D19
 17   44   31   0    45   34   59   36   73   44   87   40
 108  24   122  36   150  48   192  40   234  48   248  0
 262  48   353  0    360  52   395  0    409  52   423  56
 451  48
  68  FUNCTION  C1   D17
 17   32   31   0    45   16   59   24   73   30   87   18
 122  24   136  16   150  36   192  20   234  32   353  0
 360  28   395  0    409  36   437  32   451  28
  70  FUNCTION  C1   D23
 129  0    136  68   241  0    248  45   255  0    262  64
 283  0    290  40   297  20   304  20   311  0    318  20
 325  60   332  60   353  0    360  60   374  0    381  30
 388  30   395  30   416  0    423  60   500  0
  71  FUNCTION  C1   D6
 248  1    262  2    318  1    332  2    388  1    423  3
  72  FUNCTION  C1   D9
 136  1    248  2    262  1    290  3    318  2    332  3
 360  1    395  2    423  1
  75  FUNCTION  P8   D3
 1    833  2    500  10   10
  76  FUNCTION  P8   D4
 1    400  2    120  3    40   10   10
  77  FUNCTION  P8   D3
 1    667  2    333  10   10
  78  FUNCTION  P8   D6
 1    333  2    160  5    66   10   10
  79  FUNCTION  P8   D4
 1    312  2    188  4    125  10   10
  80  FUNCTION  P8   D5
 1    550  2    350  4    200  5    50   10   10
  81  FUNCTION  P8   D3
 1    333  2    222  10   10
  82  FUNCTION  P8   D4
 1    406  2    188  5    31   10   10
  83  FUNCTION  P8   D4
 1    800  2    300  3    100  10   10
  84  FUNCTION  P8   D4
 1    286  2    214  4    143  10   10
  85  FUNCTION  P8   D4
 1    444  2    278  4    56   10   10
  86  FUNCTION  P8   D4
 1    281  2    62   4    31   10   10
  87  FUNCTION  P8   D5
 1    381  2    143  3    95   4    71   10   10
  88  FUNCTION  P8   D4
 1    471  2    176  6    59   10   10
  89  FUNCTION  P8   D2
 3    111  10   10
```

```
 90   FUNCTION    P8    P2
1     20    10    10
 91   FUNCTION    P8    D3
1     462   2     154   10    10
 92   FUNCTION    P8    D3
1     273   2     182   10    10
 93   FUNCTION    P8    D4
1     333   2     133   5     67    10    10
 94   FUNCTION    P8    D2
2     125   10    10
  1   VARIABLE    P1+P2
  2   VARIABLE    P1+P2
  3   VARIABLE    P1+P2
  4   VARIABLE    P1+P2
  5   VARIABLE    P1+P2
  6   VARIABLE    P1+P2
  7   VARIABLE    P1+P2
  8   VARIABLE    P1+P2
  9   VARIABLE    P1+P2
 10   VARIABLE    P1+P2
 15   VARIABLE    PR1+K10
 16   VARIABLE    PR1+K5
 17   VARIABLE    PR1+K3
 18   VARIABLE    P8+K1
 20   VARIABLE    P1-W403
 21   VARIABLE    X61/K2
 22   VARIABLE    X62/K2
 23   VARIABLE    X63/K2
 24   VARIABLE    X64/K2
 25   VARIABLE    X65/K2
 26   VARIABLE    X66/K2
 27   VARIABLE    X67/K2
 28   VARIABLE    X68/K2
 30   VARIABLE    P3-W440
 31   VARIABLE    K174-W444
  1   CAPACITY    10
  2   CAPACITY    10
  3   CAPACITY    10
  4   CAPACITY    10
  5   CAPACITY    10
  6   CAPACITY    10
  7   CAPACITY    10
  9   CAPACITY    10
 10   CAPACITY    10
 11   CAPACITY    10
  1   TABLE       MP13  0     5     60
  2   TABLE       MP13  0     5     60
  3   TABLE       MP13  0     5     60
  4   TABLE       MP13  0     5     60
  5   TABLE       MP13  0     5     60
  6   TABLE       MP13  0     5     60
  7   TABLE       MP13  0     5     60
  8   TABLE       MP13  0     5     60
  9   TABLE       MP13  0     5     60
 10   TABLE       MP13  0     5     60
 11   TABLE       MP13  0     5     60
 12   TABLE       MP13  0     5     60
```

```
13    TABLE      MP13   0      5      60
14    TABLE      MP13   0      5      60
15    TABLE      MP13   0      5      60
16    TABLE      MP13   0      5      60
17    TABLE      MP13   0      5      60
18    TABLE      MP13   0      5      60
19    TABLE      MP13   0      5      60
20    TABLE      MP13   0      5      60
21    TABLE      MP13   0      5      60
1     GENERATE   1                            2              0      0      MURDER
2     ENTER      1                            3
3     ASSIGN     4      FN1          .*4      201    4
4     ASSIGN     1      K1                    5
5     ASSIGN     6      FN11                  6
6     ASSIGN     5      FN21                  260
7     ADVANCE                        .043     8      202
8     ASSIGN     3      V1           ALL      9      11
9     COMPARE    P6     E      K3             313
10    COMPARE    P6     E      K1             13
13    PRIORITY   40                  .64      710    711
11    ADVANCE                                15
15    ADVANCE                        .02      17     16
16    ASSIGN     13     K2                    17
17    PRIORITY   5                             395
18    ASSIGN     6      K1                    10
19    ASSIGN     6      K2                    11
21    GENERATE   1                            22             0      0      BURGLARY
22    ENTER      2                            23
23    ASSIGN     4      FN2          .*4      201    24
24    ASSIGN     1      K2                    25
25    ASSIGN     6      FN12                  26
26    ASSIGN     5      FN22                  260
27    ADVANCE                        .071     28     202
28    ASSIGN     3      V2           ALL      29     31
29    COMPARE    P6     E      K3             313
30    COMPARE    P6     E      K1    .772     32     33
32    ASSIGN     7      K1                    33
33    PRIORITY   40                            395
31    ADVANCE                        .772     34     35
34    ASSIGN     7      K2                    37
35    ADVANCE                        .095     37     36
36    ASSIGN     13     K2                    37
37    PRIORITY   5                             395
38    ASSIGN     6      K1                    30
39    ASSIGN     6      K2                    31
41    GENERATE   1                            42             0      0      ROBBERY
42    ENTER      3                            43
43    ASSIGN     4      FN3          .*4      201    44
44    ASSIGN     1      K3                    45
45    ASSIGN     6      FN13                  46
46    ASSIGN     5      FN23                  260
47    ADVANCE                        .098     48     202
48    ASSIGN     3      V3           ALL      49     51
49    COMPARE    P6     E      K3             313
50    COMPARE    P6     E      K1             53
53    PRIORITY   40                  .488     710    711
51    ADVANCE                                55
```

```
55    ADVANCE                          .02    57    56
56    ASSIGN      13    K2                    57
57    PRIORITY    20                          395
58    ASSIGN      6     K1                    50
59    ASSIGN      6     K2                    51
61    GENERATE    1                           62          0       0       AGG ASSAULT
62    ENTER       4                           63
63    ASSIGN      4     FN4            .*4    201   64
64    ASSIGN      1     K4                    65
65    ASSIGN      6     FN14                  66
66    ASSIGN      5     FN24                  260
67    ADVANCE                          .179   68    202
68    ASSIGN      3     V4             ALL    69    71
69    COMPARE     P6    E     K3              313
70    COMPARE     P6    E     K1              73
73    PRIORITY    40                          395
71    ADVANCE                                 75
75    ADVANCE                          .135   77    76
76    ASSIGN      13    K2                    77
77    PRIORITY    5                           712
78    ASSIGN      6     K1                    70
79    ASSIGN      6     K2                    71
81    GENERATE    1                           82          0       0       FORGERY
82    ENTER       5                           83
83    ASSIGN      4     FN5            .*4    201   84
84    ASSIGN      1     K5                    85
85    ASSIGN      6     FN15                  86
86    ASSIGN      5     FN25                  260
87    ADVANCE                          .151   88    202
88    ASSIGN      3     V5             ALL    89    91
89    COMPARE     P6    E     K3              314
90    COMPARE     P6    E     K1       .615   92    93
92    ASSIGN      7     K1                    93
93    PRIORITY    40                          395
91    ADVANCE                          .615   94    95
94    ASSIGN      7     K2                    97
95    ADVANCE                          .263   97    96
96    ASSIGN      13    K2                    97
97    PRIORITY    5                           395
98    ASSIGN      6     K1                    90
99    ASSIGN      6     K2                    91
101   GENERATE    1                           102         0       0       LARCENY
102   ENTER       6                           103
103   ASSIGN      4     FN6            .*4    201   104
104   ASSIGN      1     K6                    105
105   ASSIGN      6     FN16                  106
106   ASSIGN      5     FN26                  260
107   ADVANCE                          .185   108   202
108   ASSIGN      3     V6             ALL    109   111
109   COMPARE     P6    E     K3              314
110   COMPARE     P6    E     K1       .661   112   113
112   ASSIGN      7     K1                    113
113   PRIORITY    40                          395
111   ADVANCE                          .661   114   115
114   ASSIGN      7     K2                    117
115   ADVANCE                          .2     117   116
116   ASSIGN      13    K2                    117
```

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117  PRIORITY   5                          712
118  ASSIGN     6     K1                   110
119  ASSIGN     6     K2                   111
121  GENERATE   1                          122          0      0      SEX OFFENSES
122  ENTER      7                          123
123  ASSIGN     4     FN7          .*4     201    124
124  ASSIGN     1     K7                   125
125  ASSIGN     6     FN17                 126
126  ASSIGN     5     FN27                 260
127  ADVANCE                     .077     128    202
128  ASSIGN     3     V7           ALL     129    131
129  COMPARE    P6    E     K3             314
130  COMPARE    P6    E     K1             133
133  PRIORITY   40                .51     710    711
131  ADVANCE                     .60      134    135
134  ASSIGN     7     K2                   137
135  ADVANCE                     .1       137    136
136  ASSIGN     13    K2                   137
137  PRIORITY   5                          395
138  ASSIGN     6     K1                   130
139  ASSIGN     6     K2                   131
141  GENERATE   1                          142          0      0      NARCOTICS
142  ENTER      9                          143
143  ASSIGN     4     FN8          .*4     201    144
144  ASSIGN     1     K9                   145
145  ASSIGN     6     FN18                 146
146  ASSIGN     5     FN28                 260
147  ADVANCE                     .122     148    202
148  ASSIGN     3     V8           ALL     149    151
149  COMPARE    P6    E     K3             314
150  COMPARE    P6    E     K1    .61      152    153
152  ASSIGN     7     K1                   153
153  PRIORITY   40                         395
151  ADVANCE                     .61      154    155
154  ASSIGN     7     K2                   157
155  ADVANCE                     .273     157    156
156  ASSIGN     13    K2                   157
157  PRIORITY   5                          712
158  ASSIGN     6     K1                   150
159  ASSIGN     6     K2                   151
161  GENERATE   1                          162          0      0      MOT VEH THEFT
162  ENTER      10                         163
163  ASSIGN     4     FN9          .*4     201    164
164  ASSIGN     1     K10                  165
165  ASSIGN     6     FN19                 166
166  ASSIGN     5     FN29                 260
167  ADVANCE                     .157     168    202
168  ASSIGN     3     V9           ALL     169    171
169  COMPARE    P6    E     K3             314
170  COMPARE    P6    E     K1    .652     172    173
172  ASSIGN     7     K1                   173
173  PRIORITY   40                .05      710    711
171  ADVANCE                     .652     174    175
174  ASSIGN     7     K2                   177
175  ADVANCE                     .167     177    176
176  ASSIGN     13    K2                   177
177  PRIORITY   5                          395
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178  ASSIGN      6     K1                          170
179  ASSIGN      6     K2                          171
181  GENERATE    1                                 182          0     0     OTHER FELONIES
182  ENTER       11                                183
183  ASSIGN      4     FN10          .*4           201    184
184  ASSIGN      1     K11                         185
185  ASSIGN      6     FN20                        186
186  ASSIGN      5     FN30                        260
187  ADVANCE                         .262          188    202
188  ASSIGN      3     V10           ALL           189    191
189  COMPARE     P6    E     K3                    313
190  COMPARE     P6    E     K1      .476          192    193
192  ASSIGN      7     K1                          193
193  PRIORITY    38                                395
191  ADVANCE                         .476          194    195
194  ASSIGN      7     K2                          197
195  ADVANCE                         .05           197    196
196  ASSIGN      13    K2                          197
197  PRIOPITY    5                                 712
198  ASSIGN      6     K1                          190
199  ASSIGN      6     K2                          191
201  TERMINATE
202  TERMINATE
205  GENERATE    7     160   40                    206          0     0     INITIALIZE J
206  ASSIGN      1     K2                          207
207  ASSIGN      2     K1                          208
208  ASSIGN      6     K1                          401
210  GENERATE    7     280   5                     211          0     0     INITIALIZE B
211  ASSIGN      1     K2                          212
212  ASSIGN      2     K2                          213
213  ASSIGN      6     K2                          401
215  GENERATE    24    43    50                    206          0     0
216  GENERATE    24    57    15                    211          0     0
220  ORIGINATE         1     7                     221          1           INITIALIZE
221  ENTER       1     K10                         222
222  ENTER       2     K10                         223
223  ENTER       3     K10                         224
224  ENTER       4     K10                         225
225  ENTER       5     K10                         226
226  ENTER       6     K10                         227
227  ENTER       7     K10                         229
229  ENTER       9     K10                         230
230  ENTER       10    K10                         231
231  ENTER       11    K10                         232
232  TERMINATE
235  ORIGINATE         464   5                     236          1           GRAND JURY
236  SAVEX       1+    K1            ALL           237    239
237  COMPARE     X1    E     K4                    246
238  COMPARE     X1    E     K7                    240
239  TERMINATE
240  SAVEX       1     K0            ALL           241    246
241  COMPARE     C1    E     K147                  258
242  COMPARE     C1    E     K182                  258
243  COMPARE     C1    E     K329                  258
244  COMPARE     C1    E     K357                  258
245  COMPARE     C1    E     K364                  258
246  LEAVE       1     K10                         247
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247	LEAVE	2	K10			248		
248	LEAVE	3	K10			249		
249	LEAVE	4	K10			250		
250	LEAVE	5	K10			251		
251	LEAVE	6	K10			252		
252	LEAVE	7	K10			254		
254	LEAVE	9	K10			255		
255	LEAVE	10	K10			256		
256	LEAVE	11	K10			257		
257	TERMINATE							
258	TERMINATE							
260	SPLIT					272	261	
261	SPLIT					262	263	
262	SPLIT					264	265	
263	SPLIT					266	267	
264	ADVANCE				BOTH	268	275	
265	ADVANCE				BOTH	269	275	
266	ADVANCE				BOTH	270	275	
267	ADVANCE				BOTH	271	275	
268	COMPARE	P5	GE	K2		272		
269	COMPARE	P5	GE	K3		272		
270	COMPARE	P5	GE	K4		272		
271	COMPARE	P5	GE	K5		272		
275	TERMINATE							
272	ADVANCE				ALL	281	290	
281	COMPARE	P1	E	K1		7		
282	COMPARE	P1	E	K2		27		
283	COMPARE	P1	E	K3		47		
284	COMPARE	P1	E	K4		67		
285	COMPARE	P1	E	K5		87		
286	COMPARE	P1	E	K6		107		
287	COMPARE	P1	E	K7		127		
288	COMPARE	P1	E	K9		147		
289	COMPARE	P1	E	K10		167		
290	ADVANCE					187		
300	ADVANCE				ALL	301	310	
301	COMPARE	P1	E	K1		311		
302	COMPARE	P1	E	K2		312		
303	COMPARE	P1	E	K3		311		
304	COMPARE	P1	E	K4		312		
305	COMPARE	P1	E	K5		312		
306	COMPARE	P1	E	K6		311		
307	COMPARE	P1	E	K7		312		
308	COMPARE	P1	E	K9		311		
309	COMPARE	P1	E	K10		311		
310	COMPARE	P1	E	K11		311		
311	ASSIGN	12	FN51		BOTH	315	316	
312	ASSIGN	12	FN52		BOTH	315	316	CAT 2 BF
313	ASSIGN	12	FN53		BOTH	315	316	CAT 1 N-A
314	ASSIGN	12	FN54		BOTH	315	316	CAT 2 N-A
315	COMPARE	P12	GE	K200		317		
316	ASSIGN	10	K3		ALL	321	330	$*12$
317	TERMINATE							
321	COMPARE	P1	E	K1	.20	18	19	
322	COMPARE	P1	E	K2	.312	38	39	
323	COMPARE	P1	E	K3	.025	58	59	
324	COMPARE	P1	E	K4	.598	78	79	

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325  COMPARE    P1    E    K5    .578   98    99
326  COMPARE    P1    E    K6    .507   118   119
327  COMPARE    P1    E    K7    .335   138   139
328  COMPARE    P1    E    K9    .65    158   159
329  COMPARE    P1    E    K10   .248   178   179
330  COMPARE    P1    E    K11   .622   198   199
331  COMPARE    P1    E    K1          350
332  COMPARE    P1    E    K2          351
333  COMPARE    P1    E    K3          351
334  COMPARE    P1    E    K4          351
335  COMPARE    P1    E    K5          352
336  COMPARE    P1    E    K6          352
337  COMPARE    P1    E    K7          350
338  COMPARE    P1    E    K9          352
339  COMPARE    P1    E    K10         352
340  COMPARE    P1    E    K11         352
350  ASSIGN     11    V15               353
351  ASSIGN     11    V15               353
352  ASSIGN     11    V15               353
353  PRIORITY   *11                     354        3
354  ASSIGN     8     V18               355
355  ASSIGN     7     K0                401
395  MARK       13                      396
396  ASSIGN     8     K1                401
401  LINK       1     FR1   U
403  ADVANCE                     ALL    410   425  1
410  COMPARE    W410  L     V21         430        1
411  COMPARE    W411  L     V25         431        1
412  COMPARE    W412  L     V22         432        1
413  COMPARE    W413  L     V26         433        1
414  COMPARE    W414  L     V23         434        1
415  COMPARE    W415  L     V27         435        1
416  COMPARE    W416  L     V24         436        1
417  COMPARE    W417  L     V28         437        1
418  COMPARE    W418  L     V21         430        1
419  COMPARE    W419  L     V25         431        1
420  COMPARE    W420  L     V22         432        1
421  COMPARE    W421  L     V26         433        1
422  COMPARE    W422  L     V23         434        1
423  COMPARE    W423  L     V27         435        1
424  COMPARE    W424  L     V24         436        1
425  COMPARE    W425  L     V28         437        1
430  ADVANCE                           520        15
431  ADVANCE                           520        22
432  ADVANCE                           520        16
433  ADVANCE                           520        23
434  ADVANCE                           520        17
435  ADVANCE                           520        24
436  ADVANCE                           520        18
437  ADVANCE                           520        25
439  ASSIGN     7     K8                440
440  ASSIGN     4     FN72        ALL   441   443  2
441  COMPARE    P4    E    K1     .5    436   437
442  COMPARE    P4    L    K2           436
443  ADVANCE                     .5    434   436
444  ASSIGN     7     K8                445        2
445  ADVANCE                     .15   446   447
```

446	ADVANCE					520		26		
447	ADVANCE					520		27		
450	ORIGINATE	13	70	120		451		7		CALENDAR PREP
451	ASSIGN	1	FN60		BOTH	452	453			
452	COMPARE	P1	G	K0		454				
453	ADVANCE				BOTH	487	490			
454	SAVEX	61	FN61			455				
455	SAVEX	62	FN62			456				
456	SAVEX	63	FN63			457				
457	SAVEX	64	FN64			458				
458	SAVEX	65	FN65			459				
459	SAVEX	66	FN66			460				
460	SAVEX	67	FN67			461				
461	SAVEX	68	FN68			462				
462	SAVEX	70	CH1			463				
463	SAVEX	71	CH2			464				
464	SAVEX	72	C1			465				
465	PRINT	70	72			470				
470	UNLINK	1	P1	405		471				
471	ASSIGN	3	FN70		BOTH	475	485			
475	COMPARE	P3	G	K0		476				
476	ASSIGN	4	FN71		ALL	477	479			
477	COMPARE	P4	E	K1		480				
478	COMPARE	P4	E	K2		481				
479	UNLINK	1	P3	439		482		K7	K2	
480	UNLINK	1	P5	439		485		K7	K2	
481	UNLINK	1	P3	440		485		K6	K2	
482	ADVANCE					782		1		
782	ASSIGN	5	V30		BOTH	492	483			
483	UNLINK	1	P5	440		485		K6	K2	
485	TERMINATE									
487	COMPARE	C1	E	K251		486				
486	UNLINK	1	K174	444		488		K7	K2	
488	ADVANCE					788		1		
788	ASSIGN	2	V31		BOTH	493	489			
489	UNLINK	1	P2	444		490		K6	K2	
490	TERMINATE									
491	COMPARE	P2	LE	K0		471				
492	COMPARE	P5	LE	K0		485				
493	COMPARE	P2	LE	K0		490				
495	ORIGINATE	187	20	10	ALL	496	501	7		
496	COMPARE	C1	E	K167		502				
497	COMPARE	C1	E	K201		503				
498	COMPARE	C1	E	K229		504				
499	COMPARE	C1	E	K264		505				
500	COMPARE	C1	E	K292		506				
501	TERMINATE									
502	UNLINK	1	K24	510		507		K7	K1	
503	UNLINK	1	K13	510		507		K7	K1	
504	UNLINK	1	K28	510		507		K7	K1	
505	UNLINK	1	K11	510		507		K7	K1	
506	UNLINK	1	K12	510		507		K7	K1	
507	TERMINATE									
510	ASSIGN	7	K6			520		7		
520	ADVANCE				ALL	521	524			
521	COMPARE	P7	E	K8	.119	526	300			PLEA BF
526	ADVANCE				.61	527	600			PLEA DISP

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527  ASSIGN    7     K0          ALL   331  340
528  COMPARE   P6    E    K2     BOTH  525  528   REG BIOD
529  COMPARE   P13   E    K2           300
52A  ADVANCE                     ALL   531  540
531  COMPARE   P1    E    K1           541
532  COMPARE   P1    E    K2           542
533  COMPARE   P1    E    K3           543
534  COMPARE   P1    E    K4           544
535  COMPARE   P1    E    K5           545
536  COMPARE   P1    E    K6           546
537  COMPARE   P1    E    K7           547
538  COMPARE   P1    E    K9           548
539  COMPARE   P1    E    K10          549
53A  COMPARE   P1    E    K11          550
541  ASSIGN    9     FN75        .*9   651  350
542  ASSIGN    9     FN76        .*9   652  351
543  ASSIGN    9     FN77        .*9   653  351
544  ASSIGN    9     FN78        .*9   654  351
545  ASSIGN    9     FN79        .*9   655  352
546  ASSIGN    9     FN80        .*9   656  352
547  ASSIGN    9     FN81        .*9   657  350
548  ASSIGN    9     FN82        .*9   658  352
549  ASSIGN    9     FN83        .*9   659  352
550  ASSIGN    9     FN84        .*9   660  352
553  COMPARE   P7    E    K6     .300  529  600
529  ASSIGN    7     K0          ALL   331  340
55A  ADVANCE                     ALL   561  570
561  COMPARE   P1    E    K1           571
562  COMPARE   P1    E    K2           572
563  COMPARE   P1    E    K3           573
564  COMPARE   P1    E    K4           574
565  COMPARE   P1    E    K5           575
566  COMPARE   P1    E    K6           576
567  COMPARE   P1    E    K7           577
568  COMPARE   P1    E    K9           578
569  COMPARE   P1    E    K10          579
570  COMPARE   P1    E    K11          580
571  ASSIGN    9     FN85        .*9   661  350
572  ASSIGN    9     FN86        .*9   662  351
573  ASSIGN    9     FN87        .*9   663  351
574  ASSIGN    9     FN88        .*9   664  351
575  ASSIGN    9     FN89        .*9   665  352
576  ASSIGN    9     FN90        .*9   666  352
577  ASSIGN    9     FN91        .*9   667  350
578  ASSIGN    9     FN92        .*9   668  352
579  ASSIGN    9     FN93        .*9   669  352
57A  ASSIGN    9     FN94        .*9   670  352
610  ADVANCE                     ALL   601  610
611  COMPARE   P1    E    K1     BOTH  611  651
612  COMPARE   P1    E    K2     BOTH  612  652
613  COMPARE   P1    E    K3     BOTH  613  653
614  COMPARE   P1    E    K4     BOTH  614  654
615  COMPARE   P1    E    K5     BOTH  615  655
616  COMPARE   P1    E    K6     BOTH  616  656
617  COMPARE   P1    E    K7     BOTH  617  657
618  COMPARE   P1    E    K9     BOTH  618  658
619  COMPARE   P1    E    K10    BOTH  619  659
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610	COMPARE	P1	E	K11	BOTH	620	660	
611	COMPARE	P6	E	K1		661		
612	COMPARE	P6	E	K1		662		
613	COMPARE	P6	E	K1		663		
614	COMPARE	P6	E	K1		664		
615	COMPARE	P6	E	K1		665		
616	COMPARE	P6	E	K1		666		
617	COMPARE	P6	E	K1		667		
618	COMPARE	P6	E	K1		668		
619	COMPARE	P6	E	K1		669		
620	COMPARE	P6	E	K1		670		
651	TABULATE	1				700		
652	ADVANCE				BOTH	750	751	
653	TABULATE	3				700		
654	TABULATE	4				700		
655	TABULATE	5				700		
656	TABULATE	6				700		
657	TABULATE	7				700		
658	TABULATE	8				700		
659	TABULATE	9				700		
660	TABULATE	10				700		
661	TABULATE	11				700		
662	ADVANCE				BOTH	755	756	
663	TABULATE	13				700		
664	TABULATE	14				700		
665	TABULATE	15				700		
666	TABULATE	16				700		
667	TABULATE	17				700		
668	TABULATE	18				700		
669	TABULATE	19				700		
670	TABULATE	20				700		
700	TABULATE	21				705		
704	TERMINATE							
705	TERMINATE							
710	MARK	13				396	5	
711	MARK	13				396	14	
712	MARK	13				396	7	
750	COMPARE	P2	G	K0		704		
751	TABULATE	2				700		
755	COMPARE	P2	G	K0		704		
756	TABULATE	12				700		
	START			420				

ENTRIES IN TABLE	MEAN WEIGHT	STANDARD DEVIATION	
165	62.219	28.729	NON-WEIGHTED

UPPER LIMIT	OBSERVED FREQUENCY	PERCENT OF TOTAL	CUMULATIVE PERCENTAGE	CUMULATIVE REMAINDER	MULTIPLE OF MEAN	DEVIATION FROM MEAN
0	0	.00	.0	100.0	.000	-2.166
5	0	.00	.0	100.0	.080	-1.992
10	0	.00	.0	100.0	.161	-1.818
15	0	.00	.0	100.0	.241	-1.644
20	0	.00	.0	100.0	.321	-1.470
25	2	1.90	1.9	98.1	.402	-1.296
30	3	2.86	4.8	95.2	.482	-1.121
35	14	13.33	18.1	81.9	.563	-.947
40	7	6.67	24.8	75.2	.643	-.773
45	13	12.38	37.1	62.9	.723	-.599
50	5	4.76	41.9	58.1	.804	-.425
55	8	7.62	49.5	50.5	.884	-.251
60	5	4.76	54.3	45.7	.964	-.077
65	9	8.57	62.9	37.1	1.045	.097
70	7	6.67	69.5	30.5	1.125	.271
75	3	2.86	72.4	27.6	1.205	.445
80	10	9.52	81.9	18.1	1.286	.619
85	3	2.86	84.8	15.2	1.366	.793
90	3	2.86	87.6	12.4	1.447	.967
95	0	.00	87.6	12.4	1.527	1.141
100	0	.00	87.6	12.4	1.607	1.315
105	3	2.86	90.5	9.5	1.688	1.489
110	1	.95	91.4	8.6	1.768	1.663
115	2	1.90	93.3	6.7	1.848	1.837
120	0	.00	93.3	6.7	1.929	2.011
125	2	1.90	95.2	4.8	2.009	2.185
130	1	.95	96.2	3.8	2.089	2.359
135	2	1.90	98.1	1.9	2.170	2.533
140	0	.00	98.1	1.9	2.250	2.707
145	1	.95	99.0	1.0	2.330	2.881
150	0	.00	99.0	1.0	2.411	3.055
155	0	.00	99.0	1.0	2.491	3.230
160	0	.00	99.0	1.0	2.572	3.404
165	0	.00	99.0	1.0	2.652	3.578
170	1	.95	100.0	.0	2.732	3.752

REMAINING FREQUENCIES ARE ALL ZERO

A SAMPLE COMPUTER TABLE

	Column 1		Column 2		Column 3		Column 4		Column 5	
SAVE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	511	71	0	72	13	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	462	71	0	72	27	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	500	71	0	72	41	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	518	71	0	72	55	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	459	71	0	72	69	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	375	71	0	72	83	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	512	71	0	72	104	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	523	71	0	72	118	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	475	71	0	72	132	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	347	71	0	72	146	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	718	71	0	72	160	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	1015	71	0	72	230	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	928	71	0	72	244	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	781	71	0	72	258	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	668	71	0	72	272	73	0	74	0
SAVEX	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE	NR	VALUE
	70	630	71	0	72	279	73	0	74	0

NOTE: Column 1 represents the number of transactions in the scheduling queue just prior to creating a computer calendar. Column 2 has no meaning. Column 3 represents the cumulative number of days the model has been running. For example, 230 represents the 230th day of 1970. Columns 4 and 5 have no meaning.

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9. The information for this portion of the system was obtained primarily from interviews with Judge Robert Jones, May 18, 1971 and attorney Larry Woods, May 25, 1971.

10. Budget for Year Ending December 31, 1971, Fulton County, Georgia, p. 59.

11. The information for this portion of the system was obtained primarily from an interview with Mr. Charles Stewart, Chief of the District Attorney's Indictment Division, June 18, 1971.

12. The information for this portion of the system was obtained primarily from an interview with Mr. Carter Goode, attorney on the District Attorney's staff, June 1, 1971.

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Jack Boyle, Administrative Assistant to the Fulton County District Attorney, April 19, 1971.

Hinson McAuliffe, Solicitor General of Fulton County, April 19, 1971.

James McGovern, Executive Director of the Metropolitan Atlanta Committee on Crime and Juvenile Delinquency Inc., April, 1971.

Dr. Robert Stubbs, Professor of Law at Emory University, May 4, 1971.

Judge Charles A. Wofford, Superior Court Judge of Fulton County, May 6, 1971.

Dr. James Maddox, Assistant Dean in the School of Urban Life, Georgia State University, May 25, 1971.

Mrs. Margaret Lindsey, Executive Director of the Atlanta Bar Association, May 27, 1971.

Julius Lennard, member of past Fulton County Grand Juries, June 15, 1971.

Charles S. Stewart, Chief of the Indictment Division for the District Attorney of Fulton County, June 18, 1971.

Mrs. Lillian Witcher, Jury Clerk of Fulton County, June 25, 1971.

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Sam Brownlee, Administrative Assistant to the County Manager of Fulton County, June 29, 1971.

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